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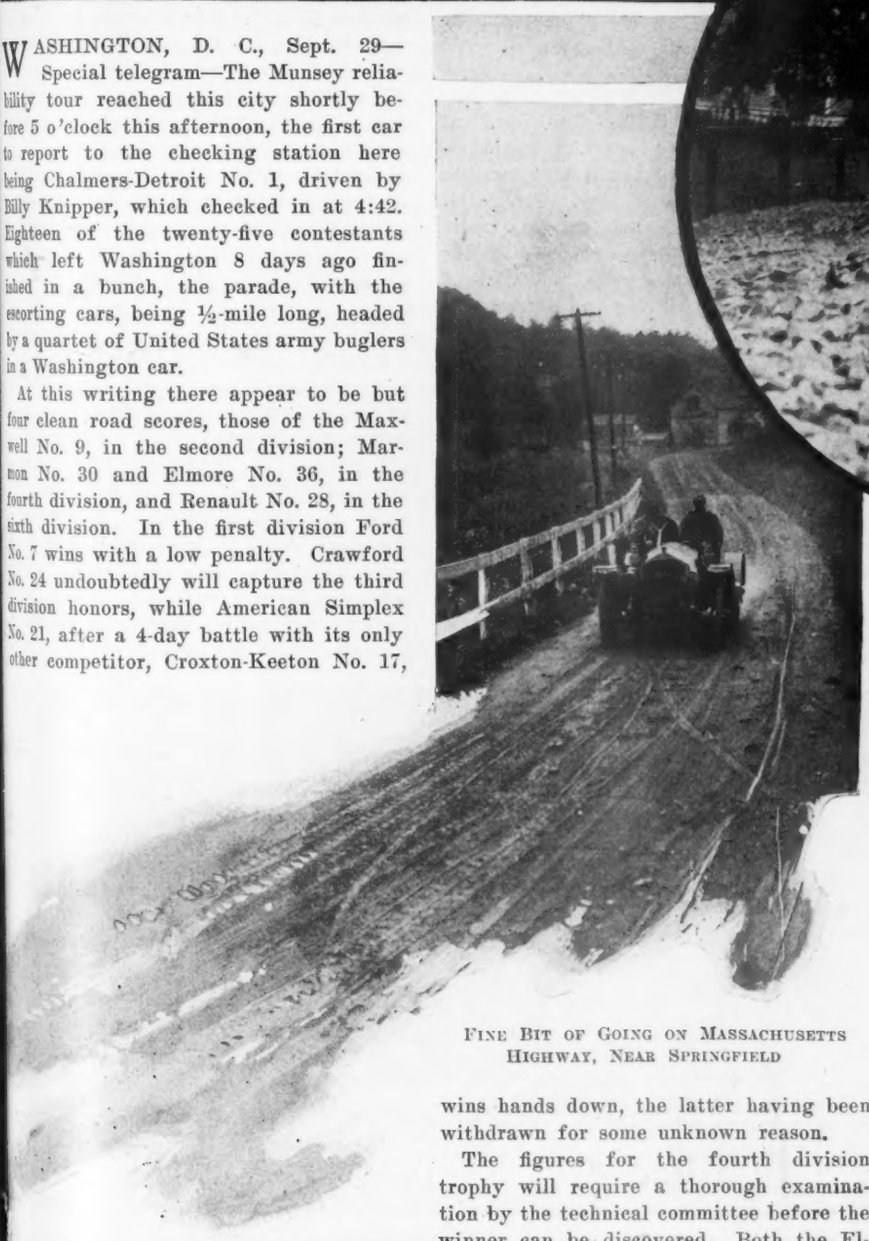
MOTOR AGE

PERFECT SCORES FEW IN THE MUNSEY TOUR

WASHINGTON, D. C., Sept. 29—Special telegram—The Munsey reliability tour reached this city shortly before 5 o'clock this afternoon, the first car to report to the checking station here being Chalmers-Detroit No. 1, driven by Billy Knipper, which checked in at 4:42. Eighteen of the twenty-five contestants which left Washington 8 days ago finished in a bunch, the parade, with the escorting cars, being ½-mile long, headed by a quartet of United States army buglers in a Washington car.

At this writing there appear to be but four clean road scores, those of the Maxwell No. 9, in the second division; Marmon No. 30 and Elmore No. 36, in the fourth division, and Renault No. 28, in the sixth division. In the first division Ford No. 7 wins with a low penalty. Crawford No. 24 undoubtedly will capture the third division honors, while American Simplex No. 21, after a 4-day battle with its only other competitor, Croxton-Keeton No. 17, wins hands down, the latter having been withdrawn for some unknown reason.

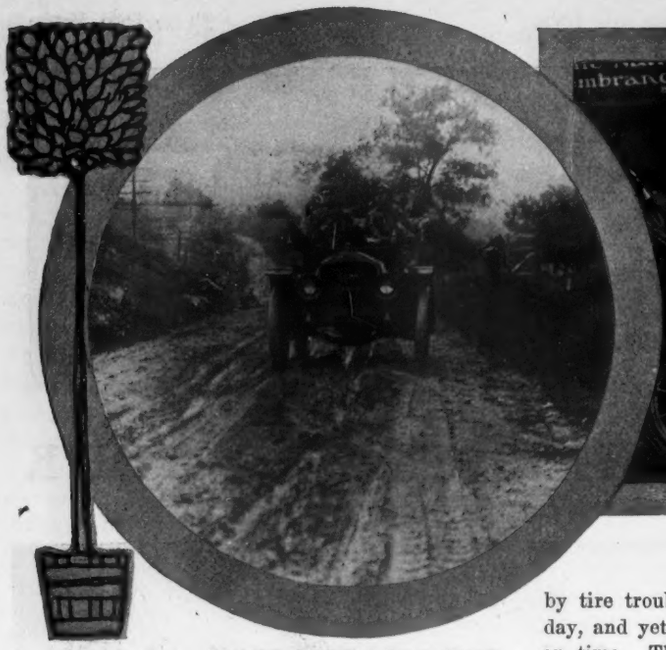
New Stretch Near Springfield, Mass.



Fine Bit of Going on Massachusetts Highway, Near Springfield

The figures for the fourth division trophy will require a thorough examination by the technical committee before the winner can be discovered. Both the Elmore and the Marmon, which, by the way, is a Glidden car, ran like 8-day clocks. One of the most creditable performances of the entire contest was that of the Elmore, driven by Frank Hardart, Jr., the only amateur driver in the fourth division. He played things safe throughout, finishing with a few minutes to spare at every control. It is predicted that his careful driving may have left his car in better condition than that of his rival.

The run was a great success, demonstrating as it did the utility of the average American car over the kinds of roads that are traversed by 75 per cent of the cars owned in this country, and under weather conditions which forced them to the limit. On 5 of the 7 days rain and muddy roads tested the endurance not alone of the cars but of their drivers and passengers as well. That so large a proportion should have finished the run is, under the circumstances, little short of remarkable. Several of the cars were rendered tem-



ELMORE, PERFECT ROAD SCORE

CROXTON-KEETON, NO. 17, PROMINENT IN RUN

porarily hors du combat, generally by trouble caused by skidding on the slippery roads; but after long delays, in two instances aggregating 24 hours, the drivers, by pushing their cars all night, managed to rejoin the run and continued to the finish.

Never before in the history of endurance runs has the entertainment feature been so much in evidence. In every large city where overnight stops were made the local motorists exerted themselves to show the tourists a good time, and these club receptions were supplemented by the efforts of the Munsey managers in Philadelphia, Boston and New York. Indeed, the entertainment feature was so much in evidence that it interfered greatly with the prompt scoring of the daily work of the cars. Banquets in the Hub and in New York caused the calling off of the nightly meetings of drivers and observers. The results of Friday's run were not posted till Sunday night. On Monday night the Munsey banquet at the Waldorf-Astoria and on the following night the theater party at Keith's theater in Philadelphia, had put off the penalty announcements for those days till after the finish of the run. Entrants and drivers were considerably put out over the delays, the newspaper men particularly so, but Referee Trego was adamant. He wouldn't let these interfere with pleasure.

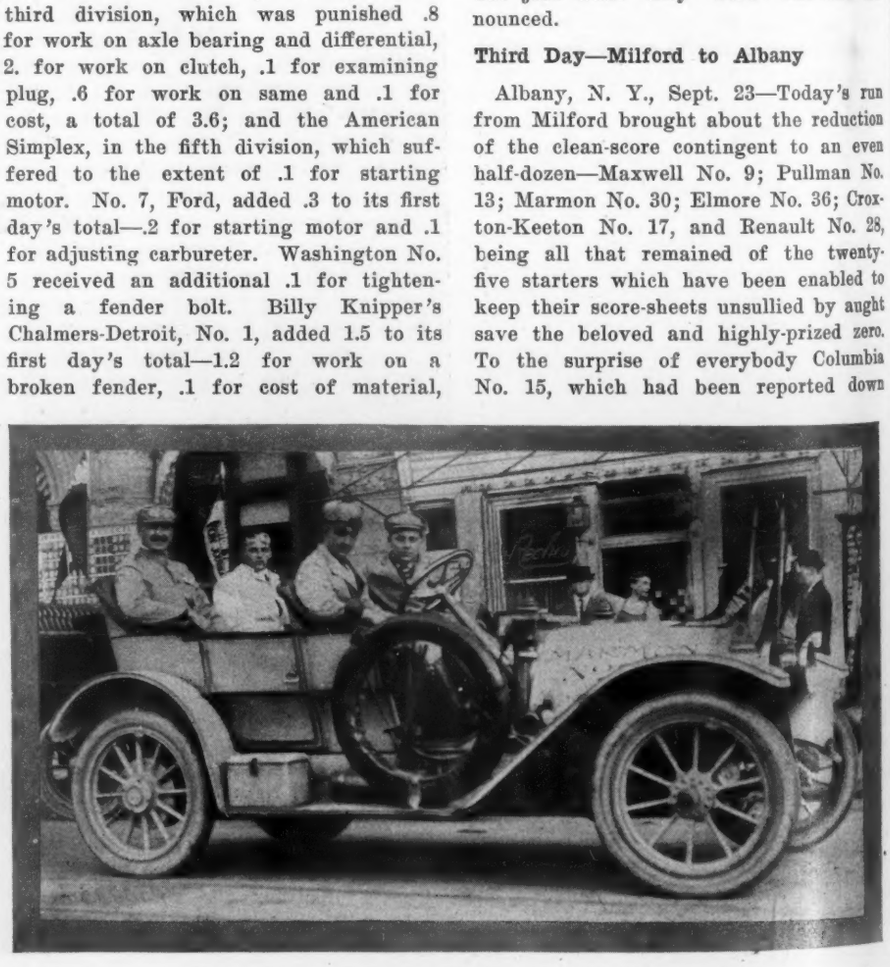
The class of the cars entered never was better demonstrated than on the fourth day, the worst of the trip, when no fewer than seventeen of the twenty-three cars then on the road finished with absolutely clean scores. Of course, tire troubles were especially frequent on that day, but notwithstanding the numerous delays from this cause not one of the seventeen found it necessary to ask for the time allowed them by the rules in the event of late arrival at controls. Billy Knipper, in Chalmers-Detroit No. 1, lost 1 hour 14 minutes by tire trouble on that awful fourth day, and yet reported at each control on time. The brake and other tests are now in progress, but the technical examination will not be begun until tomorrow, it is announced tonight.

Second Day's Penalties

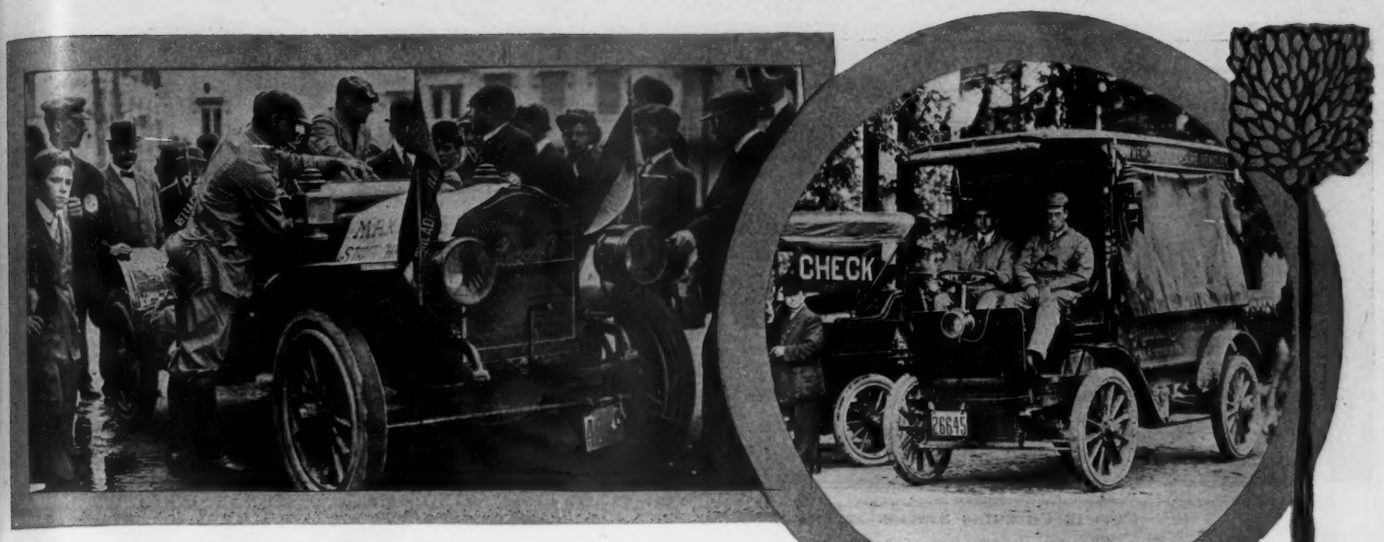
Milford, Pa., Sept. 22—The excellent roads and the easy schedule were responsible for the comparatively penalties inflicted on the second day. Two cars, however, were eliminated from the clean-score list—the Pullman, No. 37, in the third division, which was punished .8 for work on axle bearing and differential, 2. for work on clutch, .1 for examining plug, .6 for work on same and .1 for cost, a total of 3.6; and the American Simplex, in the fifth division, which suffered to the extent of .1 for starting motor. No. 7, Ford, added .3 to its first day's total—.2 for starting motor and .1 for adjusting carbureter. Washington No. 5 received an additional .1 for tightening a fender bolt. Billy Knipper's Chalmers-Detroit, No. 1, added 1.5 to its first day's total—1.2 for work on a broken fender, .1 for cost of material, .1 for oiling and .1 for starting motor, the latter due to a too-quick shut-down to avoid a collision with the chairman's car, which he had been following like a shadow all day. The heaviest sufferer of the day was the Croxton-Keeton, No. 16, whose 4.3 dements were made up of 4.1 for work on universal joint and .2 for cost of material—the latter a double penalty for not carrying same in the car. In addition to the 1000 points penalty for withdrawal the Selden, No. 34, had a few tenths handed to it for work and material but just what they were was not announced.

Third Day—Milford to Albany

Albany, N. Y., Sept. 23—Today's run from Milford brought about the reduction of the clean-score contingent to an even half-dozen—Maxwell No. 9; Pullman No. 13; Marmon No. 30; Elmore No. 36; Croxton-Keeton No. 17, and Renault No. 28, being all that remained of the twenty-five starters which have been enabled to keep their score-sheets unsullied by aught save the beloved and highly-prized zero. To the surprise of everybody Columbia No. 15, which had been reported down



MARMON, WHICH FINISHED WITH CLEAN ROAD SCORE



MAXWELL, WHICH ESCAPED ROAD PENALTIES

AUTOCAR TRUCK THAT DID YEOMAN SERVICE

and out at Allentown lined up for the start. Driver Jacobi had hunted up a new wheel and Mr. Hall ordered him to proceed. He went out on the highways and unsuccessfully besought quite a number of apparently unoccupied individuals to accompany him to Milton. Before he succeeded in landing his quarry he was compelled to pay two of them $3.50 apiece. He checked in at about 1 a. m., and will continue the run.

The rain, which had first put in an appearance on Wednesday afternoon, continued intermittently throughout the night, and was still in evidence at this morning's start. "Chains and oilskins" was the watchword, and it was not until late in the afternoon that the tourists ran out of the storm, and shed their rain armor for dusters. Driver Billy Knipper, of Chalmers-Detroit No. 1 on which the Motor Age correspondent is a passenger, came as near as a hair to being eliminated from the run altogether. An apparently gentle bovine stood at the side of the road watching the approach of the blue car, until it was almost upon her when she lowered her head and charged. Billy's recent flag-to-flag pathfinding experience in the southwest, however, stood him in good stead, for, with a matador-like swerve, he sidestepped his car around and continued on his way unharmed, her horns just grazing the rear wheels.

Driver McBurney, of Matheson No. 27 reported having been scared nearly stiff 12 miles out of Newburg by a wild-looking old man with a shotgun, who stood at the side of the road with blood in his eye, determined on vengeance or financial recompense for a pair of chickens which one of the leading cars had killed.

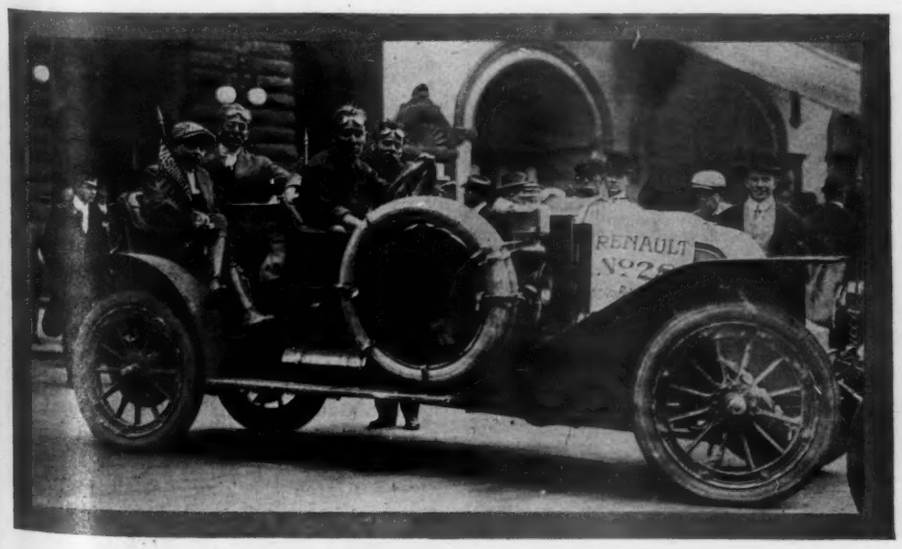
At 2:30 in the afternoon the No. 11 Maryland whose steering gear had been badly wrenched by a quick turn up a high curb to avoid an accident at Kingston, was ditched near New Baltimore, 40 miles farther on, when Driver Behrens tried to make a sharp left turn and found the steering gear locked. The ditch was 6 feet deep, but nobody was hurt, although Technical Committeeman Jesse L. Cassard, Jr., of Baltimore, who was a passenger on the car, was catapulted 20 feet down the hill. The car's front axle was badly bent and the steering gear in bad shape, but was reported at night that the car would be gotten out and put in shape to continue the run to the very finish. Maryland No. 5, Arrison driver, also was rendered hors de combat at Athens, 33 miles from Albany, although it was reported that it, too, would continue after repairs were made. The Washington's trouble was that the drive shaft kept slipping out at the universal joint. To make effective repairs it was necessary that a new part should be made, and the crew was last reported as at a blacksmith shop, hard at work shaping the part. Observer Howard L. Cole was given permission to leave the car and come on to Albany.

This evening Referee Trego received a telegram from Charles J. Glidden, congratulating him and the promoters on the success of the run up to date and regretting that he was unable to accompany them.

The Autocar truck, which is standing up under the heavy work like a veteran, finished close behind the competing cars, and is apparently in first-class shape.

Today, for the first, time began to figure prominently in the penalizations. As a starter the committee figured up a total of 38[illegible].7 for the Columbia, No. 15, which accumulated that high total as a result of its Allentown accident. Of this amount 354 points were for late arrival, the remainder being made up of 25.7 for work and 3 for cost of material. The little Hupmobile, No. 29, added .4 for work in adjusting its carbueter. Reo No. 26 left the clean-score class by reason of 4 points penalty for as many minutes lateness in reporting at Albany.

Pullman No. 12, in addition to 30 points against for late arrival at Albany was penalized 36.7 for work on fan shaft and .6 for cost of material—a total of 67.3 for the day. Crawford No. 24 was another to leave the clean-score class on the third day, its observer's card showing work on lamp bracket to the extent of .3 and .1 for



RENAULT THAT WENT THROUGH WITH CLEAN SCORE

CARS IN CHECKING STATION AT PHILADELPHIA

AMERICAN SIMPLEX, A CLASS WINNER

starting motor. Washington No. 31 accumulated 31.2 demerits during the day—31 for late arrival here and .2 for starting motor. The 2.2 collected by its sister, Washington, No. 32, were 2 for late arrival here, .1 for starting motor and .1 for work on springs.

Croxton-Keeton No. 16, during the day had spark-plug trouble which cost it 1.1 points penalty—.9 for work and .2 for cost of material. Matheson No. 27, also gathered 1.1 demerits for the day by reason of work on mud-pan to the extent of .8, labor on fender .2 and cost .1. Pullman No. 37, which failed to report here this evening, was withdrawn, the car being shipped to New York from Saugerties by boat. It is understood that the cause of the withdrawal was irremediable trouble with the rear axle.

Fourth Day—Albany to Boston

Boston, Mass., Sept. 26—For the third successive day J. Pluvius interfered with the enjoyment of the Munsey run tourists, and to show what he could do in his particular line he persisted in his attentions during the entire day. In the early morning he manifested himself in a steady, depressing drizzle, which gradually developed until when Jacob's Ladder, the crest of Massachusetts' backbone between the Hudson and the Atlantic, was reached the storm had attained the proportions of the equinoctial downpour which the weather prophets had predicted for this time of year. Entering Boston in a veritable cloudburst, the officials were lenient enough to allow the contestants to give their numbers and beat it to the shelter of the official headquarters at the Hotel Somerset, without waiting for the formality of signing the cards, which was done later at the hotel.

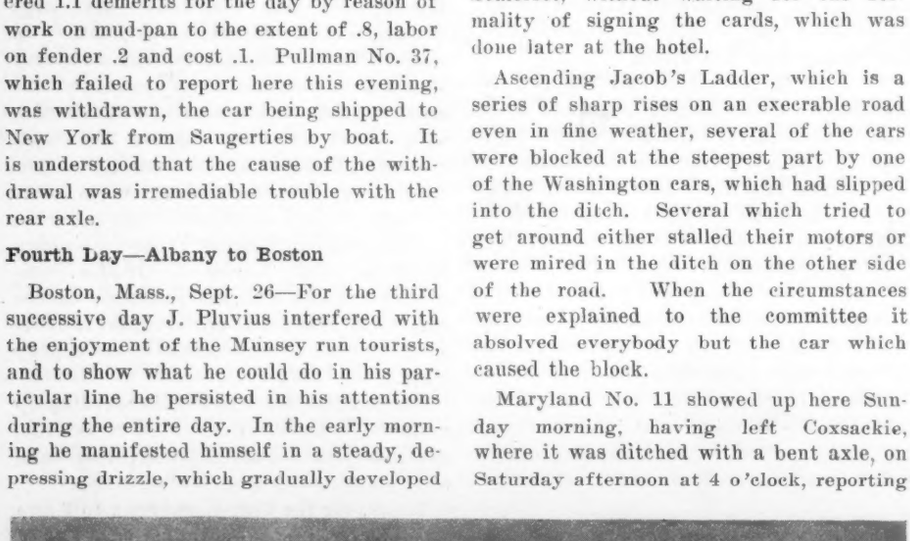
Ascending Jacob's Ladder, which is a series of sharp rises on an execrable road even in fine weather, several of the cars were blocked at the steepest part by one of the Washington cars, which had slipped into the ditch. Several which tried to get around either stalled their motors or were mired in the ditch on the other side of the road. When the circumstances were explained to the committee it absolved everybody but the car which caused the block.

Maryland No. 11 showed up here Sunday morning, having left Coxsackie, where it was ditched with a bent axle, on Saturday afternoon at 4 o'clock, reporting at Albany at 5.19 and at the Boston checking station at 6.15 the next morning, after an all-night drive. Pullman No. 37, which had not reached Albany when the run left there, was reported to have been shipped to New York by boat from Saugerties.

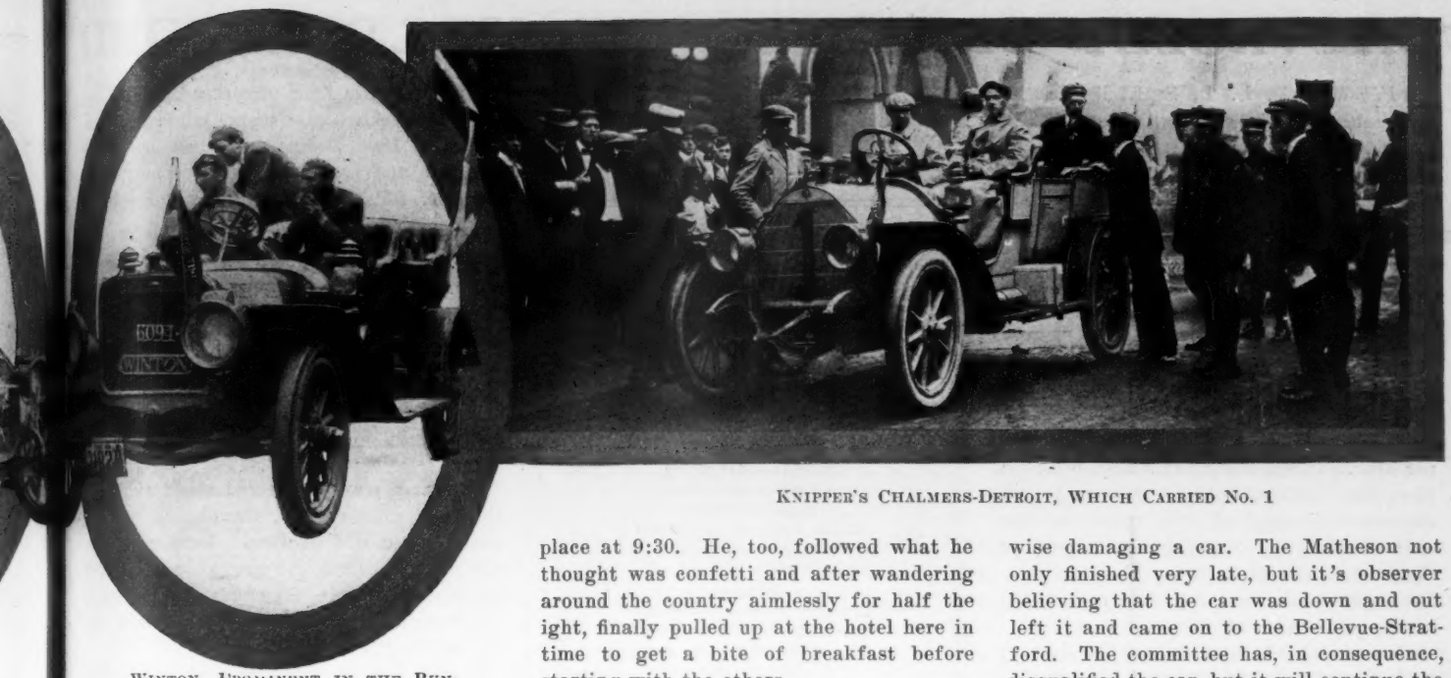
The E-M-F pilot car lost a wheel before it reached Worcester and it was abandoned by its crew, which went on to Worcester to get a new one, leaving the entire burden of the work of laying the trail on its confrere, the Midland.

On the run's arrival at the Hub Mr. Glidden met the tourists and carried the officials off to supper at the Somerset. Later in the evening the Bay State Automobile Club furnished entertainment through the medium of a lunch and smoker. Saturday afternoon the tourists were the guests of the Boston Journal, the Munsey paper at the Hub, at a shore dinner at Bass Point, Nahant.

Despite the storm, penalties were not so numerous as on any of the preceding days. In the third division Washington No. 5, was given .6 demerits—.5 for work on the propeller shaft and .1 for starting motor. The 358.1 rolled up by its sister car, No. 31, was mostly for the delay occasioned by a bent axle—340 points, the remainder being made up of 18 points for work and .1 for starting motor. Of the Maryland's total of 118.6, 1 was due for lateness on checking in, 117.5 for work on a bent axle and .1 for starting motor. Columbia No. 15, which now has nearly a thousand demerits chalked up against it, accumulated over half that large total on the fourth day's run, the 567.3 bad marks being made up of 493 points for lateness at the Boston checking station, and 74.3 for work on a broken connecting rod. Matheson's 1.3 was for work on one of the springs, the cost penalty to be added



MIDLAND, ONE OF THE PILOT CARS



KNIPPER'S CHALMERS-DETROIT, WHICH CARRIED NO. 1

WINTON, PROMINENT IN THE RUN

when the run reaches Washington, the price catalog having been left at the capital.

Fifth Day—Boston to New York

Willimantic, Conn., Sept. 26—Three days of almost steady rain had put the roads in such frightful condition that at a hurried meeting this morning the committee decided to split up the long run to New York, making this place the night stop. The start was made at 1:30 this afternoon, and all the cars but the Autocar truck reported here.

The distance was 99 miles, and darkness came on so early that not a few of the cars accumulated time penalties by reason of having lost the road. Many drivers reported that in the light of the front lamps the wet autumn leaves very much resembled bedraggled confetti, and some few of them went miles out of their way before they discovered their error.

Croxton-Keeton No. 17, which had been clean-score up to date, acted badly throughout the trip, and tonight it was officially announced that both it and its sister car, No. 16 in the fourth division, had been withdrawn. The Autocar truck, which is carrying many suitcases with the tourists' glad rags, came to grief on a steep hill in Providence, skidding on the slippery roadway, and smashing a wheel and twisting an axle. Many of the travelers have, in consequence, been compelled to hang around the Hooker house in their wet clothing, and the committee was besieged with requests to do something in the matter, for tomorrow the run will be in New York.

The decision to cover a portion of the fifth day's run this afternoon was arrived at so suddenly that it found Driver Goss, of Corbin No. 18, out of Boston, and unaware of the change of plans. He arrived back at the Hotel Somerset at 6 o'clock, ate supper and started on the road to this place at 9:30. He, too, followed what he thought was confetti and after wandering around the country aimlessly for half the ight, finally pulled up at the hotel here in time to get a bite of breakfast before starting with the others.

Willimantic to New York

New York, Sept. 27—The start for the metropolis was made at 6:30 o'clock this morning, in a nasty, penetrating drizzle, the day's run from Willimantic totaling 140.4 miles. As originally laid out the run was scheduled to go via New Britain, but a request from the authorities of that place to omit it from the itinerary on account of a children's street parade, caused the committee to issue an order that the dope book be ignored as far as Meriden, sole reliance being placed upon the confetti as a guide. At Hartford, which was reached at about 9 o'clock, the Hartford Rubber Works Co. furnished a box lunch, including bottled coffee, and the Automobile Club of Hartford furnished guides in and out of the town.

Today saw the elimination of Matheson No. 27 from the run. Driver McBurney, while negotiating a sharp turn at One Hundred and Fifty-fifth street, skidded into a post, smashing a wheel and otherwise damaging a car. The Matheson not only finished very late, but it's observer believing that the car was down and out left it and came on to the Bellevue-Stratford. The committee has, in consequence, disqualified the car, but it will continue the run as a non-contestant. The Autocar truck is still non est, and not a few of the tourists attended the banquet attired in their khaki working clothes.

Sixth Day—New York to Philadelphia

Philadelphia, Sept. 28—The start from New York this morning was made, as usual, in a dispiriting drizzle. Gotham's streets were in such condition that chains as a skid-preventer were absolutely useless. Several of the cars pirouted on the slippery asphalt, but only one of them, as far as known, had any trouble. Knipper, in Chalmers-Detroit No. 1, averting a collision by clever work, but choking his motor in the operation. Once away from New York the weather began to improve, and by the time the run had worked clear of the Staten Island and Perth Amboy ferries and was straightened out for the long run down to Atlantic City, Old Sol began to give evidence of getting to work once

(Continued on page 14.)

E-M-F THAT SERVED AS A PILOT

CHEVROLET CREATES NEW SPEED RECORD

Buick Driver Averages 69.9 Miles Per Hour at Riverhead, American High-Water Mark

RIVERHEAD, L. I., Sept. 29—Special telegram—The Long Island stock chassis derby is now history, marred by one fatality and noted for its exceptional demonstration of speed. Louis Chevrolet, in his victory in class 4, with the 30-horse-power Buick, traveled at a speed which averaged 69.9 miles per hour, this being the greatest sustained flight ever accomplished in an American road race.

The event for big cars was taken by Ralph de Palma, a driver of established reputation, whose Fiat outlasted its opponent and covered the 227.5 miles at a pace of 62.4 miles per hour. It was during this session of the race that Herbert Lytle, a driver of long experience, besprinkled with numerous close calls, skidded and overturned at a bend in the road, seriously injuring himself, while his mechanic, James Bates, died as a result of the unfortunate affair.

Unquestioned interest existed in class 5, $851 to $1,250, which resulted in a double victory for the Maxwell Q. The winning car went the 91 miles at 53.8 miles per hour, with the second Maxwell not far behind.

Despite the ideal fall weather the attendance was small, though there was splendid racing. Fifty per cent of the profit was to have been divided among the winning drivers, who were represented by George Robertson. Unfortunately, there will be a deficit instead of a profit, and of course all that the drivers will get will be cups won in the respective classes.

The timing was taken care of by A. P. Warner's time-recording instruments, presided over by the inventor himself, assisted by the members of the New York Timers' Club.

Suffolk county, which adjoins Nassau county, the scene of the Vanderbilt cup races, wanted a motor contest, and so "Senator" Morgan was prevailed upon to assume the burden of its conduct. A 22¾-mile triangular course was laid out, with two 9-mile stretches, and the grandstand located a couple of miles from Riverhead, which had been the storm center of the miniature Vanderbilt. Five classes, arranged according to price and not piston displacement, were provided for, the sum total of starters being fifteen, divided as follows:

Class 1, $4,001 and over—Rainier, Disbrow; Mercedes, Armstrong; Fiat, de Palma; Rainier, Lund.

Class 2, $3,001 to $4,000—American, Hughes; Palmer & Singer, Lescault.

Class 3, $2,001 to $3,000—Sharp-Arrow, Sharp.

Class 4, $1,251 to $2,000—Chalmers-Detroit, Droge; Buick, Chevrolet; Buick, Burman.

Class 5, $851 to $1,250—Maxwell, See; Buick, Finch; Maxwell, Dorley; Maxwell, Costello; Overland, Riess.

It was a scantily covered stand that saw the start at 9 o'clock, though the parking place contained several hundred cars. Around the course the spectators numbered thousands, to watch the passing of the speed craft without expense, except, perhaps, the loss of time.

Lund's Rainier was protested in the matter of price in class 2, and while the case will go to the A. A. A. contest board, the car was transferred to class 1, and its time taken for both ten and eight laps.

It was anticipated that the big Mercedes, once the property of W. K. Vanderbilt, Jr., and now owned by Candymaker Loft, would supply the most plentiful speed, which it did with an opening round in 1901, a race approaching 65 miles per hour. De Palma's Fiat did the circuit in 22:12. Anxiously Lytle was waited for but came not, and the meager report finally arrived that the Apperson had met with disaster and turned over near Mattituck. Disheartening news ultimately came that both Lytle and Bates were badly injured, the latter fatally. A skid from the partially-crowned road at a bend while traveling at top speed, was the only explanation of the accident, which included colliding with a telephone pole. Physicians were quickly summoned, but Bates was beyond aid, though an examination of Lytle resulted in the report that his recovery was almost certain.

During its second round the big Mercedes had an inning of tire troubles, which made frequent replacement necessary and gave the lead temporarily to Disbrow's Rainier. In the third lap, the German-built car came back with 18:49, which made a lead of over a minute on de Palma's Fiat. In the next whirl, the Italian closed up some of the gap, the two being only 23 seconds apart. In the fifth lap the Mercedes had engine difficulty, which caused the passing by the Fiat.

News of the Apperson catastrophe reached the grandstand just as the ailing Mercedes drew alongside its pit. Mrs. George W. Loft had been much upset by the information, and making her way to the car directed that it be withdrawn at once. Barring unusual trouble, this left the Fiat apparently a sure-enough winner, for the others were a long ways behind.

While the big cars were going the great-

TABLE OF RESULTS

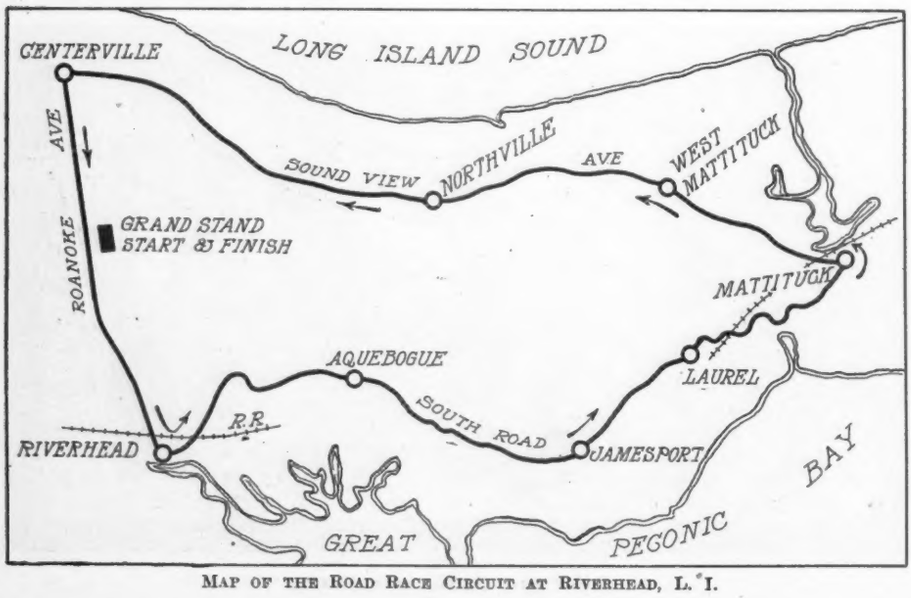
CLASS 1—$4001 AND UP
Distance 227.5 miles
Ten laps
Winner
Fiat—De Palma
Time—218 minutes
Average speed 62.4 miles per hour
Other Starters
Rainier—Lund
Mercedes—Armstrong
Rainier—Disbrow
Apperson—Lytle

CLASS 2—$3,001 TO $4,000
Distance 182 miles
Eight laps
Winner
Palmer & Singer—Lescault
Time, 179 minutes 4 seconds
Average speed, 60.9 miles per hour
Other starter
American—Hughes

CLASS 3—$2,001 TO $3,000
Distance 136.5 miles
Six laps
Winner
Sharp Arrow—Sharp
Time 129 minutes 2 seconds
Average speed 69.9 miles per hour
Only one starter

CLASS 4—$1,251 TO $2,000
Distance 113.75 miles
Five laps
Winner
Buick—Chevrolet
Time 97::36.3
Average speed 69.9 miles per hour
Other starters
Buick—Burman
Chalmers-Detroit—Droge

CLASS 5—$851 TO $1,250
Distance 91 miles
Four laps
Winner
Maxwell—See
Time 101 minutes, 22 seconds
Average speed 53.8 miles per hour
Other starters
Maxwell—Costello
Buick—Finch
Maxwell—Dorley
Overland—Riess



MAP OF THE ROAD RACE CIRCUIT AT RIVERHEAD, L. I.

est distance, the smaller classes were having some interesting fights. In class 4 the Buick, of Chevrolet, evolved as the startling winner at a pace which averaged 69.9 miles per hour. Burman, with another Buick, figured as the runner up, only 10 minutes behind. In class 2, Lescault's Palmer & Singer proved a winner, practically unopposed. Its opponent, the American, driven by Hughes, failed to make very much of a fight, owing to water-cooling difficulties. The only contestant in class 3, the Sharp-Arrow, driven by its maker, supplied an average of 63.6 miles per hour, which was an exceptionally good performance.

In class 5 the littlest fellows of the race, the two Maxwells, captured the first two places, Arthur See's model Q going the route in 53.8 miles per hour. J. Finch's Buick ran third.

De Palma's running throughout the ten laps was very consistent, varying from 20:56 in the seventh, which was his fastest, at a speed of 65.2 miles per hour, to 23:48 in the second. Five of his laps, or 50 per cent of his race, was run on the 21-second order, his times being: Lap three, 21:12; lap five, 21:23; lap six, 21:50; lap nine, 21:06, and lap ten, 21:19-6. His time in any one lap was not like the Mercedes, that ran its first lap in 19:01, or at 71.8 miles per hour; or better still when it negotiated its third lap in the remarkable time of 18:49, or 72.54 miles per hour. Neither did his performance show that phenomenal speed of Chevrolet's Buick, which did a lap in 77.2 miles per hour. On the other hand, he drove a consistent race from start to finish.

The spectacular performance of the day, for a distance of 113.75 miles, was Chevrolet's Buick, with an average of 69.9 miles for the five laps. It is scarcely right to compare this with de Palma's performance without remembering that Chevrolet went just half of the distance. Chevrolet's last two laps were his fast ones, his fourth being 17:40, or 77.2 miles per hour, and his last in 19:10, or at 72.21 miles per hour. This speedy work recalled the fast running of Lancia in his Fiat at the second Vanderbilt cup race, when he averaged over 70 miles per hour until put out of first place by colliding with Christie.

His running mate, Burman, made fast time for his first three laps, doing them in 19:56, 19:55 and 20:10, respectively, but his last two were slow, being 23:33 and 22:30. The cause of Burman's let-up in his pace is not known.

The Sharp-Arrow deserves mention because of its consistent running in its six laps without a competitor.

ROAD RACING RECORDS

FOREIGN RACES

74.3 MILER PER HOUR—Made by Nazzaro in Fiat in Florio cup race, Italy, September 6, 1908; distance, 328.2 miles.

71.8 MILES PER HOUR—Made by Trucco in de Dietrich in Florio cup race, Italy, September 6, 1908; distance, 328.2 miles.

AMERICAN RACES

69.9 MILES PER HOUR—Made by Chevrolet in a Buick in Riverhead sweepstakes, Long Island, September 30, 1909; distance, 113¾ miles.

65.11 MILES PER HOUR—Made by Wagner in Fiat in American grand prix at Savannah, Ga., November 26, 1908; distance, 402 miles.

64.9 MILES PER HOUR—Made by Hemery in Benz in American grand prix at Savannah, Ga., November 26, 1908; distance, 402 miles.

64.45 MILES PER HOUR—Made by Hanshue in Apperson in Santa Monica road race, Los Angeles, Cal., July 10, 1909; distance, 202 miles.

64.36 MILES PER HOUR—Made by Burman in Buick in Riverhead sweepstakes, Long Island, September 30, 1909; distance, 113¾ miles.

64.3 MILES PER HOUR—Made by Robertson in Locomobile in Vanderbilt cup race, Long Island, October 24, 1908; distance, 258.6 miles.

64.25 MILES PER HOUR—Made by Lytle in Isotta in motor parkway sweepstakes, Long Island, October 10, 1908; distance, 234.6 miles.

64 MILES PER HOUR—Made by Lytle in Isotta in Vanderbilt cup race, Long Island, October 24, 1908; distance, 258.6 miles.

RESULTS IN THE SWEEPSTAKES RUN AT RIVERHEAD, L. I., WEDNESDAY, SEPTEMBER 30

CLASS 1, CARS $4001 AND OVER; 10 LAPS; DISTANCE 227.5 MILES

No.	Car	H. P.	Driver	1	2	3	4	5	6	7	8	9	10
3	Fiat	45	R. De Palma	22:12	46:00	67:12	89:26	110:49	132:39	153:35	176:10	197:16	218:35⅘
					23:48	21:12	22:14	21:23	21:50	20:56	22:35	21:06	21:19⅘
8	Rainier	45	C. H. Lund	31:06	55:45	77:45	99:48	133:26	156:06	179:16	206:50	Still r	unning
					24:39	22:00	22:03	33:38	22:40	23:10	27:34		
1	Rainier	50	L. A. Desbrow	22:42	44:35	66:35	108:26	132:24	158:23	191:17	Still r	unning	
					21:53	22:00	41:51	23:58	26:09	32:44			
2	Mercedes	90	G. Armstrong	19:01	45:48	64:37	89:03	128:28	Withd	rawn			
					26:47	18:49	24:26	39:25					
4	Apperson	50	H. Lytle	Met with accident on first lap									

CLASS 2, CARS $3,001 TO $4,000; 8 LAPS; DISTANCE 182 MILES

No.	Car	H. P.	Driver	1	2	3	4	5	6	7	8	9	10
7	Palmer & Singer	60	E. Lescault	21:21	41:26	63:42	85:09	106:36	133:18	157:03	179:04		
					20:05	22:16	21:27	21:27	26:42	23:45	22:01		
5	American	50	H. Hughes	33:27	62:41	90:55	138:24	182:41	215:14	Still	runnin	g	
					29:14	28:14	47:29	44:17	32:33				

CLASS 3, CARS $2,001 TO $3,000; 6 LAPS; DISTANCE 136.5 MILES

No.	Car	H. P.	Driver	1	2	3	4	5	6	7	8	9	10
9	Sharp-Arrow	40	W. H. Sharp	21:24	42:33	63:29	84:29	105:36	129:02				
					21:09	20:56	21:00	21:07	23:26				

CLASS 4, CARS $1,251 TO $2.000; 5 LAPS; DISTANCE 113.75 MILES

No.	Car	H. P.	Driver	1	2	3	4	5	6	7	8	9	10
11	Buick	30	L. Chevrolet	19:43	39:46	60:55	78:35	97:36					
					20:03	21:09	17:40	19:10					
12	Buick	30	R. Burman	19:56	39:49	59:59	83:32	106:02					
					19.53	20:10	23:33	22:30					
10	Chalmers-Detroit	30	H. F. Droge	30:03	60:01	89:41	119:18	Still r	unning				
					29:58	29:41	29:37						

CLASS 5, CARS $851 TO $1,250; 4 LAPS; DISTANCE 91 MILES

No.	Car	H. P.	Driver	1	2	3	4	5	6	7	8	9	10
15	Maxwell	22	A. See	25:49	51:12	76:15	101:22						
					25:23	25:03	25:07						
18	Maxwell	22	T. Costello	26:23	52:06	78:07	104:13						
					25:43	26:01	26:07						
16	Buick	18	J. Finch	27:36	54:31	82:27	135:23						
					26:55	27:56	52:56						
17	Maxwell	22	M. Dorley	27:10	53:25	With	drawn						
					26:15								
19	Overland	28	E. L. Riess	31:52	133:59	With	drawn						
					102:04								

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The Motor Town At Hand

FROM statistics given out by the south park commissioners in Chicago it is very apparent that in a few years hence the sphere of the horse vehicle in large cities will be particularly limited. The park commissioners made counts of the number of motor cars, horse vehicles, motor cycles, and bicycles passing different points on its boulevard system for consecutive days, extending over a week, and the results of which show that on week days three motor cars to every one horse vehicle traverse the whole boulevard system; and on Sundays the proportion is much larger in favor of the motor car. On a Sunday the total number of vehicles passing a certain point on one street was 9,052, of which number 6,392 were motor cars, 2,147 horse vehicles, 237 motor cycles, and 276 bicycles. On a week day of a total of 13,964 vehicles passing a certain point 9,772 were motor cars and 3,290 horse-drawn vehicles. This three-to-one proportion of motor cars to horse vehicles is sufficient to establish beyond question of doubt the fact that road builders in rural districts and park and street road commissioners in cities must build roads and streets to suit conditions of motor traffic rather than horse traffic. It is imperative on road builders to construct highways with respect to the predominating mode of travel and with due regard to new methods of locomotion.

SENATOR HOOKER, of New York state, in his address before the national good roads convention in Cleveland a week ago sounded this same note of warning to road builders gathered from every state in the union. "It is foolish to construct the present type of macadam road throughout the country with the hope that it will withstand present-day traffic. It will stand up under 10 and 12-miles-an-hour horse traffic, but it is entirely inadequate for the motor car," said Senator Hooker. It is quite useless for road builders to close their eyes to this condition of the present day. In European countries the road-building problem has been wrestled with in many ways, chief of which is by increasing the cost of road maintenance. Europe has learned that it takes money to maintain roads after they are built, and that maintenance begins as soon as the road is completed. In not a few American states during the last few years excellent state highways have been built, but once completed the road commissioners seem to have imagined their work was done and that the highway would last forever. No road has as yet been built which will fulfill such utopian conceptions. Roads must be maintained, otherwise the building of them without due arrangements for their maintenance becomes a useless expenditure of public funds.

IN his address at the good roads convention, Senator Hooker referred to a present conception of road maintenance which he thinks will prove highly disastrous. This is the feeling among many good road enthusiasts that the maintenance of roads must be under government control centered in the federal capital. These enthusiasts entirely overlook the fact that in each city, village, or rural municipality are residents who have followed the road construction story from its earliest infancy and who are equally competent to look after the roads in their districts as are government officials. The centering of road maintenance in competent local hands unquestionably will result in a stronger local feeling for good roads, than where this responsibility is vested with strangers.

Rubber Prices Soaring

RUBBER is now selling at $2.10 per pound, which is more than twice the price of 10 months ago. As a result of this extraordinary price there has been a general increase in the price of pneumatic tires for cars during the last week, some concerns raising the price on casings 15 per cent and on inner tubes 20 per cent, whereas the majority of the others have made an increase of 10 per cent on casings and inner tubes. In every instance the reason advanced for the increase in price is solely the uncertainty of the rubber market and the present high water prices. The majority of the rubber used in tires is made from Para gum obtained from the plantations of the valley of the Amazon and Orinoco rivers, of South America. This is not the only area from which rubber gum is received, but it is the only place where Para gum is produced, and Para gum, owing to its elasticity and resilience, has become the standard of the rubber market. Gums are obtained from Central America, Mexico, Africa and the East Indies, but the grade of these gums is very inferior, and they are not used in tire production excepting such concerns as do compounding of these gums with pure Para. The determining of the market price depends solely on the price of Para gum. Of this gum there are two shipments per year: One designated the fall delivery, which is delivered about October, and the other the spring delivery in April. The exact value of the fall delivery is at present a problematic one and it is not known yet what height the pound price may yet attain.

THE annoying aspect of the rubber situation is the effect it will have on the car market. Many prospective buyers have absurdly exaggerated conceptions of tire cost and these present conceptions together with the present increase in prices may result in a great reduction of the car sales. This peculiar condition may, however, impress on the minds of car operators, as well as prospective buyers, that the mileage obtained from a set of tires to a very large extent depends on the driver. If the driver is reckless and applies the brakes whenever he wishes to reduce speed or stop, instead of making proper use of the throttle for this work, it is natural that his tire expense will be heavy. In fact, very much heavier than it would be with sane driving. Twenty miles of reckless fast driving over rough frozen roads at this season of the year will work greater havoc with tires than 500 miles of conservative driving.

TIRE mileage may also be increased by giving proper attention to small surface cracks in the sides of casings before serious damage has been done. Preparations are on the market with which these can be readily repaired, but if they are left to themselves so that water and other substances may work their way into the fabric the complete destruction of the tire becomes only a matter of time. Reduction of tire upkeep can also be accomplished by two other methods: First, proper inflation of the tire at all times; and, second, increasing tire sizes. The selection of the size of tire fittings rests entirely with the manufacturer of the car, but the inflation of the tire is solely with the driver. This acute situation of the rubber industry will serve to impress on drivers and owners the fact that if a car is going on a tour with five passengers and baggage more air pressure is needed than when running about the city with not more than one or two passengers and no baggage.

CHICAGO COUNTS ITS BOULEVARD TRAFFIC

CHICAGO, Sept. 28—It long has been a mooted question as to the division of the traffic on Chicago boulevards. For several years it has been clearly apparent that the motor car has crowded the horse into the background, but it was not until this summer that any official step was taken to prove this point. Then the south park commissioners undertook the work and their report, issued this week, shows clearly that the motor car traffic on the south side boulevards is more than three times greater than the horse. To get all this data required system and to get it the park commissioners selected twenty-four different points. At each they stationed a man whose duty it was to tab each passing vehicle for 24 hours. This was done on a Sunday and again on a week day in order that the amount of traffic might be correctly judged. The result of these observations shows the following grand total of vehicles passing the twenty-four stations, although it does not necessarily mean that number of different vehicles, for, of course, many of them passed several of the checking stations:

	Sunday	Week day
Motor car	64,571	67,518
Horses	19,903	16,456
Motor cycles	2,882	2,050
Bicycles	4,021	3,753
Total	91,377	89,777

The summary of the report shows that the greatest traffic is on Michigan avenue just south of Jackson boulevard. The Sunday count shows that 9,052 vehicles passed there in 24 hours, while on a week day the total reached 13,964. Subdivided, the Sunday traffic consisted of 6,392 motor cars, 2,147 horse-drawn vehicles, 237 motor cycles and 276 bicycles. On the week day there were 9,772 motor cars, 3,290 horse-drawn rigs, 119 motor cycles and 218 bicycles. Here the horse holds his own fairly well, but going farther south he loses his foothold. At Michigan avenue and Thirty-third street, a most important station, there were 5,245 motor cars checked on Sunday in comparison with 245 horse-drawn vehicles. Taking a week day, the report shows 5,951 motor cars and 587 of the equines. Taking the night count, it is found that at Michigan and Jackson 2,111 motor cars and 702 horse-drawn vehicles went by during the night hours, while at Michigan and Thirty-third there were 1,777 motor cars and thirty-six horse-drawn vehicles.

PORTOLA ROAD RACE CARD

San Francisco, Cal., Sept. 24—The sanction of the contest board of the American Automobile Association has been granted for the Portola road race to be held in Alameda county, across the bay from San Francisco, on Saturday, October 23, under the auspices of the Automobile Club of California. Immediately following the granting of this sanction, the official entry blank was issued by L. P. Lowe, chairman or the racing committee of the automobile club, who is in active charge of the preparations for the contests. The contest has been divided into three classifications, so that there are virtually three races in progress at the same time. The first classification is the free-for-all, which includes cars having a piston displacement in excess of 600 cubic inches, and which is also to be open to cars which have duly qualified for either of the two following events. The distance of this race is to be about 258 miles, which is twelve laps of the course across the bay. The first prize in this event is to be $2,000, in plate or cash, at the option of the entrant. The second prize will be $600, and to the entrant of the third car will go $400. Event No. 2 is to be for stock chassis having a piston displacement of from 451 to 600 cubic inches and a minimum weight of 2,400 pounds. The cars in this class will make ten laps of the course, or about 215 miles. The first prize will be $1,000, the second prize $400 and the third prize $100. Event No. 3 will be for stock chassis having a piston displacement of from 301 to 450 cubic inches and a minimum weight of 2,100 pounds. Seven laps of the course are to be made, a distance of about 150 miles. To the winner will go cash or plate valued at $700, to the second place car $200, and to the third car $100. The entry fee in each of the events is 10 per cent of the amount of the first prize, which fee must accompany the application for entry. If the car makes a bona fide start the fee is to be returned to the entrant, otherwise it will be retained by the automobile club. Entrants in the second and third events and desiring to compete in the first event will be required to complete the full number of laps of their respective stock chassis events to qualify for event No. 1, and they must have completed the full number of laps before the official calling off of the contest in order so to qualify. The idea of the managers of the race in arranging the classification has been to provide a class for medium-powered cars and another for high-powered cars, with a free-for-all to which will be eligible any car of any kind, including special racing machines that might be sent out from the east to take part. The first car to enter the race is a Knox, which has been named by the Reliance Automobile Co., of this city. It is reported that the car will be driven by Fred Wiseman, a Californian, who drove a Stoddard-Dayton car to fourth place in the Indiana trophy race at Crown Point, Ind.

The contest will be held during Portola week, when hundreds of thousands of persons will be drawn to San Francisco from the entire Pacific coast to take part in the celebration of the discovery of San Francisco bay and also of the rehabilitation of San Francisco after its great disaster of April, 1906.

Chicago Vehicle Summary

JACKSON AND LA SALLE

	Motor cars	Horse vehicles	Motor cycles	Bicycles
Sunday	2,661	1,736	157	248
Week day	3,820	3,290	119	216
MICHIGAN AND JACKSON				
Sunday	6,392	2,147	237	276
Week day	9,772	3,730	213	249
MICHIGAN AND FOURTEENTH				
Sunday	5,989	1,142	219	285
Week day	8,475	1,389	229	337
MICHIGAN AND THIRTY-THIRD				
Sunday	5,245	654	206	245
Week day	5,951	587	207	214
PRAIRIE AND TWENTY-SECOND				
Sunday	452	147	10	9
Week day	628	255	9	55
SOUTH PARK AND THIRTY-FIRST				
Sunday	925	384	71	39
Week day	859	655	25	57
SOUTH PARK AND THIRTY-FIFTH				
Sunday	4,300	453	163	136
Week day	4,748	388	133	112
OAKWOOD AND LANGLEY				
Sunday	2,318	357	54	105
Week day	2,476	330	44	169
GRAND AND OAKWOOD				
Sunday	2,375	769	174	129
Week day	5,693	626	125	203
GRAND AND FIFTY-FIRST				
Sunday	3,864	1,180	140	262
Week day	3,747	652	125	266
DREXEL AND FORTY-THIRD				
Sunday	2,675	439	69	112
Week day	2,344	366	51	171
WASHINGTON PARK AND FIFTY-SEVENTH				
Sunday	3,881	1,545	192	369
Week day	2,550	676	101	223
MIDWAY ENTRANCE TO WASHINGTON PARK				
Sunday	5,634	1,976	316	310
Week day	3,340	580	195	291
WEST SIDE DRIVE AND FIFTY-EIGHTH				
Sunday	1,458	688	90	200
Week day	1,463	372	62	166
WASHINGTON PARK AND GARFIELD				
Sunday	2,336	606	44	38
Week day	2,771	614	125	239
MIDWAY WEST OF WOODLAWN				
Sunday	3,297	1,382	195	223
Week day	2,806	595	73	172
WEST DRIVE AND FIFTY-SEVENTH				
Sunday	2,795	1,028	155	244
Week day	1,406	393	70	165
WEST DRIVE AND SIXTY-FOURTH				
Sunday	1,445	408	61	197
Week day	910	249	18	62
GERMAN BUILDING				
Sunday	2,722	1,307	134	293
Week day	1,543	472	65	201
JACKSON PARK, MIDWAY ENTRANCE				
Sunday	3,874	1,555	195	295
Week day	2,516	537	61	185

POLICE PREVENT NEW YORK 24

New York, Sept. 25—The police prevented the starting of the 24-hour race scheduled to begin at Brighton Beach track at 5 o'clock yesterday. The track was a quagmire of rain and mud over which it would have been impossible for the cars to have raced without great danger to the driver, it is claimed, and the police informed the officials of the Motor Racing Association that they would stop the race if it was started. The chairman of the committee of the Motor Racing Association protested against the postponement of the race, as it had been extensively announced that the event would be run "rain or shine." The police would not listen to the chairman, however, so the race was officially declared off until some future date, probably October 15 and 16.

COST OF CRUDE GUM FORCES UP TIRE PRICES

CHICAGO, Sept. 27—For the second time this fall there has been an increase in the price of tires, Morgan & Wright, G & J and Hartford coming out last week with the announcement. The three companies above referred to made their announcement late last Wednesday night, jumping the prices on casings 15 per cent and on inner tubes 20 per cent, the latter price being higher because of the fact that more pure rubber is used in their manufacture than in the former. Today several others followed suit, although the increase was not so great, Diamond, Goodrich, Goodyear and Ajax announcing a jump of 10 per cent on casings and inner tubes alike.

Scanning the rubber market shows why this increase has been made by some and is contemplated by others. On last Wednesday the price on crude Para rubber had reached $2.07 a pound, the highest ever known, and there was no means of telling just how high it would go, that depending upon the supply. The increase on tire prices therefore was made, although it is only a little over 2 months ago that the first jump was made. A year ago this month users of tires were greatly gratified when the rubber companies on their own accord reduced prices about 15 per cent, although at the time it was the dealer who suffered, because his percentage was cut, and the consumer given the advantage. At that time the price of crude rubber was about 92 cents a pound, and the month before it was as low as 78 cents.

Following this reduction in prices, though, the cost of crude rubber began steadily going up. It opened at $1.18 last January, went to $1.23 in February, to $1.23 and a fraction in March, to $1.24 in April, to $1.29 in May, to $1.44 in June, and then to $1.68 in July. Following the July quotations there came a general increase in tire prices of 15 per cent, although at that time crude rubber was bringing 50 per cent more than it was when prices on tires were reduced in September, 1908.

The tire manufacturers claim that the uncertainty regarding the price of tires will prevail until the new crop of crude rubber is heard from. Just when that will be is not known; a shipload is likely to be reported coming into some of the Atlantic seaports at any time, and such news undoubtedly will cause a fluctuation in prices of rubber. Even a rumor may cause it, as was shown recently, when it was reported a consignment was at hand. At that time rubber dropped from $1.98 to $1.76.

Notwithstanding these tire increases, it is pointed out by one concern that the consumer is getting better prices now than he was 4 years ago, and as an example of this he cited his list of January 1, 1906, which showed that for a bolted-on type, including the inner tube, he was getting $38.58 for a 28 by 3-inch, with rubber at 68 cents, whereas today he is selling the same thing for $24.35 at wholesale. This has been made possible by increased factory facilities and also by making in quantities.

Taking up the India Rubber World, one finds that this organ is much concerned over the phenomenally high price of crude rubber. Last July it stated that "it may be that the rates just now prevailing will not be long maintained, but no present indications point to really cheap rubber. A salient fact is that the recent record high prices accompanied probably the largest production of the raw material in any year, from a constantly increasing number of sources, under conditions which preclude any idea that supplies have been under manipulative control, and in spite of the fact that the market is soon to receive larger quantities of rubber from plantations. Clearly the explanation is in a growing demand for rubber in the industries—a larger production of goods either actual or in prospect."

Again in August it points out that "whatever the cause of the fluctuations in rubber, each succeeding slump has stopped at a higher point than the one before, until it would now appear that the normal price of rubber is twice as high as 20 years ago, in spite of the greatly increased production meanwhile. The demand for rubber has grown steadily from the date of its first utilization, and continues to grow. Whatever may be the future capacity of the world to produce rubber, it is now below the world's needs for the material. This year's output is larger than ever, while every indication points to a still greater increase for 1910. The condition is near at hand when motor car tires alone will call for as much rubber as was consumed in the whole industry in the United States 10 years ago—the date of the introduction of the motor car." This same authority declares that the high prices are not the result of a corner, ascribing them to the prosperity of the country, which finds itself in a position to enjoy so-called luxuries. "It is such conditions of prosperity in America—to say nothing of the rest of the world—that make rubber cost more—not the manipulation of a few traders buying and selling. They could not sell at current prices unless the world wanted rubber goods in larger volume year after year," it adds.

Situation in Akron

Akron, O., Sept. 27—The price of crude rubber naturally is the main issue among the many tire-making concerns which make Akron their headquarters. Two of these, the Goodrich and the Goodyear, are out with announcements of increases in prices, but both regret the necessity for the step. The Goodrich company, in a circular letter to its agents, states that it regrets the necessity for making the advance in price and adds: "The positively alarming condition of the crude gum market is the sole cause. The shortage of gum is a source of uneasiness to all those engaged in the manufacture of rubber goods, aside from the fact that what is available can only be secured at frightfully high figures. We must ask the indulgence of the trade at large. Under conditions such as prevail we cannot reasonably be expected to grant any concessions in the way of stocking dealers at old prices."

This circular only enhances the remarks made by Second Vice-President H. E. Raymond, of the Goodrich company at the annual session of the Goodrich branch managers and agents held here Thursday, Friday and Saturday of last week. Some fifty were in attendance and after discussing plans for 1910 they listened to remarks by Mr. Raymond, who, in the course of his discourse, had the following to say regarding the price of crude gum:

"It may be well to touch on the possibility of the advance about going into effect representing a settled condition you and your trade might bank on as reasonably certain to be maintained for the balance of the 1910 season. We don't know. Here at the factory the pencil points are worn down to a blunt nothing. We read a gum quotation with pale faces and before scanning the reports from the Amazon caress secretly a rabit's foot each of the officials of the company carries out of sight but get-at-able. So far as the source of prices for the balance of this season is concerned, it is not so much what our competitors may at any time do, but what we shall do under certain contingencies should they arise. It's a problem of costs. The cause of the increased costs may be interesting to review as we judge it. Some little time ago the price of crude gum was regulated by the boot and shoe consumption. That industry was the barometer by which a rubber manufacturer gauged his possible inflection in the way of cost of crude. The clouds in the sky, the rain or snow that fell, had a bearing on the use of rubbers and the price of gum was affected thereby. Today it doesn't make any difference whether it's a deluge or a blizzard; no one predicts high gum prices.

"Predictionists look at the motor cars running, or to be produced, in that year. We ought to have foreseen this. We knew of the enormous number of cars in use in all foreign markets and the great demand made on the gum market from abroad. We knew of the car wheels turning on American roads eating up the gum. It requires little thought to figure out what effect this has had and is having on the visible supplies of gum. It simply melted away. The world is riding in cars and the cars are shod with rubber and every roadbed is hungry for it. So we can hardly look for any immediate relief in the way of crude.

There may be and possibly will be some recessions from the present high levels. But that will not help. Our new prices are not based on the market quotations at present. If we were to figure on that level as a permanent thing, prices must again advance.

"Our present prices are based on hope, hope that the market will recede. Chances for any lower tire prices in any near future are remote. Bear in mind that a lower price than at present for crude will not mean any lower price on tires as prices are not tuned to this level. The chances are more in line with another forced advance. It is not our purpose to make it unless we have to."

The Goodyear company raised its prices on Saturday and following the announcement the company told its agents that "this advance is made necessary by further advances in the cost of crude rubber, fine Para being today quoted in the neighborhood of $2.10 per pound, by far the highest price ever known."

Empire Prices Go Up

Jeannette, Pa., Sept. 28—The Empire Tire Co. has advanced its price on casings 15 per cent and on inner tubes 20 per cent. This advance took effect yesterday, and was made solely because of the $2.10 per pound price of rubber. In speaking of the gradual increase of the price of rubber, this concern states, "In July a 15 per cent increase was made because at that time there was an increase in the price of Para gum of from 92 cents to $1.20 per pound. From $1.20 per pound to $2.10, the present price of Para gum, is a tremendous jump and this difference in price is not in anywise compensated for by the 15 and 20 per cent advance in prices. In November, 1907, the price of rubber was $1.35 per pound, but after the panic the price fell to 92 cents which resulted in a reduction of 20 per cent on tire prices. Since then there has been a constant increase in the price of rubber with consequent increases of tire lists."

Morgan & Wright Increase Prices

Detroit, Mich., Sept. 25—Morgan & Wright have raised their prices on tires, but the new schedule shows that the increase is uniform in all the sizes. "The present conditions of the rubber market are responsible for this," they say. "While all representative manufacturers are constantly improving the construction of material entering into their products, this has little to do with it."

Ajax Announces Increase

New York, Sept. 27—Announcement was made today by the Ajax-Grieb Rubber Co. of an increase of 10 per cent for casings and tubes over its previous list. This advance is made compulsory because of the enormous increase in the cost of crude rubber, which today is selling for $2.10 per gross pound, which is subject to a shrinkage of about 20 per cent, declares President Horace De Lisser.

Many Changes Among Hub's Motor Car Dealers

Boston, Mass., Sept. 27—The 1910 selling season is now on in earnest in this city and already the Boston dealers are shaping their plans for placing cars. Orders are coming in so well that New England next year will have many more cars than were seen this year. Yet it was thought the high water mark had been reached. The New England field looks so good that it is increasing in size by new agencies being opened. There has been a number of changes within the past few weeks in this section and there will be more before the year ends. The retail agency for the Jackson has passed from H. T. Merry to a new firm comprising J. W. Stevens and A. H. Sowers. The two latter were formerly with the Pope-Hartford. They have opened a salesroom on Boylston street. H. G. Kilbourne retired from the Kilbourne-Corlew company and Frank W. Coughlin took his place, so the firm that now handles the Velie is known as the Corlew-Coughlin company. It has leased an entire building in the downtown section for salesrooms, garage and repair shops, which will be well equipped.

W. A. Webber, who formerly was New England distributor of the American roadster, is now with the Allen-Kingston. Demarest Lloyd has the agency for the American. The Allen-Kingston agency, under the direction of Volney Jacobs, has grown so that another building near the salesroom had to be secured for a garage. The Auto Motor Co., which handles the Regal, and was comprised of George H. Lowe, M. A. Dikeman and J. T. Nelson, has changed. Mr. Lowe is ill and has resigned, while W. S. Mutty has purchased Mr. Nelson's interest.

Three cars have figured in changes from agencies to branch houses. The Thomas was being handled by the Whitten-Gilmore company, but now it is looked after under a company with C. S. Henshaw as the local manager. Mr. Henshaw had the Thomas agency here several years ago. The Oldsmobile was being handled by the Algonquin Motor Car Co., but the death of Arthur E. Adams, the local manager, came just as a change had been made into a branch with C. E. Putnam as manager. The Oakland was being handled by Fred E. Smith, and as it is in the General Motors Co. it went in with the Oldsmobile.

Cars that have been represented here in the past, but were dropped are again being taken up. The Haynes was being handled for some time by C. S. Henshaw, but when he took the Thomas managership he let it go. Now it is being handled by H. C. and C. D. Castle, who also have the Lozier. The Apperson also is in new hands. This was handled for some years by Fred E. Smith. Now W. S. Russell, for many years with the Speare oil firm, has taken this agency. The Rainier, formerly handled here by A. E. Morrison, is now represented again in the Hub, this time by George T. Gould. The Berkshire has been out of the local field for some time, but it is coming back again and so is the Grout. The annual crop of rumors are floating about relative to additional changes, and more may be expected any time.

W. H. Sharp, of the Sharp-Arrow, spent some days here after the Lowell races relative to opening an agency for that car in the Hub. William E. Metzger also was here last week, supposedly to arrange for an agency for the new car which he proposes to build in Detroit, but he did not announce any appointment.

There have been changes among the salesmen too. G. V. Brown, formerly with the Studebaker branch in New York, has joined the Boston office of the Thomas. Another recruit for the Thomas is R. K. Sweet, who was with the Franklin. F. E. Woodell has joined the Olds-Oakland forces.

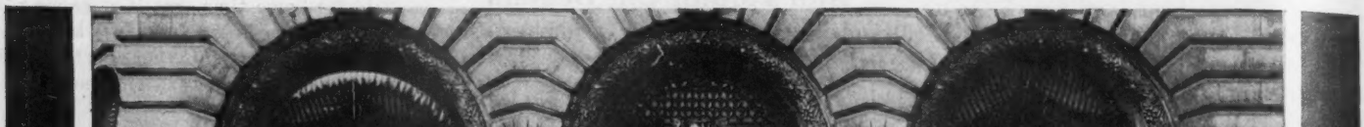
The Continental Tire Co. has opened its own branch here on Boylston street and it is in charge of E. H. Kidder. F. M. Broadhead, who was with the Diamond forces has gone over to the Continental. The Goodrich company is having a new building erected on Boylston street and Manager Dole of the Royal Tourist has leased a large building on Norway street for a garage and repair shop. The big building recently bought by Frank J. Tyler, manager of the Boston Maxwell branch, has been reconveyed to Benjamin Briscoe and a new company is being formed to conduct a big garage on the property. It is well located and ought to attract many cars.

LOOKS UP COMPANY'S STATUS

Lansing, Mich., Sept. 27—The attorney general's department is engaged in an investigation of the status of the General Motors Co. and its right to do business in Michigan under its present form of organization. The secretary of state has raised the question of whether the state is entitled to a franchise fee from the big corporation, but there is a bigger point in controversy, that is as to whether the laws permit holding companies to be organized in Michigan or in other states to own the stock of Michigan corporations. John J. Carton, of Flint, representing the General Motors Co., has discussed some of the law points involved with Deputy Attorney General Chase and there will be another conference in the matter. Deputy Chase says no decision has been reached yet.

The Olds Motor Works has filed articles of incorporations increasing the capital stock from $2,000,000 to $4,000,000. Inquiry at the works brought no information as to the reason for the increase, all queries being referred to the officials of the General Motors Co. It is believed that the increase is a part of the plan for reorganization of the plants controlled by the General Motors Co.

GOOD ROADS SESSION AT CLEVELAND ENDS



GROUP SHOWING DELEGATES IN ATTENDANCE AT GOOD ROADS CONVENTION IN CLEVELAND

CLEVELAND, O., Sept. 23—The second annual national good roads convention, under the auspices of the American Automobile Association, which ended its 3-day session here today, resulted in much interest having developed on the good roads problem. The keynote to the present day situation of road building was voiced by S. Percy Hooker, chairman of the New York State highway commission, who began by saying: "Macadam roads are showing day after day that they are incapable of withstanding the wear and tear of motor cars and trucks. It is difficult to say what construction or process makes the most durable state highway, but in my experience I have found that the surface of the road gives the best results when it is composed of a mixture of coarse stone, such as the foundation of the road is made of, together with viscuous material such as oil, containing from 85 to 90 per cent of asphalt. It is absolutely useless to continue macadam roads with the fine material top dressing as used at present, because, although this will withstand ordinary 10 and 12-mile-an-hour horse traffic, it is entirely inadequate for motor car use. The sooner road builders get away from the hallucination that they can build macadam roads for $2,000 a mile the better. This is impossible, and it is a foolish waste of money to attempt such. Another fallacy of the road question is that all building of highways must be done directly by the state or national government. This is the wrong idea entirely, for the best results always have been obtained when the road work has been done by local officials backed by state advice and funds.

"The proposition to construct boulevards from one boundary of a state to the other is another wrong principle. Such boulevards will be of benefit solely to those living on them, and to an occasional motorist or two. The farmer will derive no benefit whatever from such a plan.

"The New York idea is to connect all villages and populous centers by plain, serviceable highways. By this plan, if a farmer cannot find a suitable market for his produce at one place, it is easy enough for him to journey to another town. I would never advise the centralizing of this constructing power in a state commission."

Logan Waller Page, director of the office of public roads, Washington, D. C., read a particularly valuable paper on the comparison of the cost of construction and maintaining roads in Europe, as compared with America. The paper in full being as follows:

The present road situation in the United States may be briefly summed up as follows: In mileage we have the most tremendous system of roads which any country has ever possessed since the world began. According to a careful road census, the length of all of our roads amounts to 2,155,000 miles. The most liberal estimate of our annual expenditure on these roads, both in money and labor, was a fraction over $79,000,000 in 1904, or about $1.05 per capita. At the same rate this would be an expenditure of about $90,000,000 at the present time. England, with only 150,000 miles of road, spends about $80,000,000 a year, or about fourteen times as much per mile.

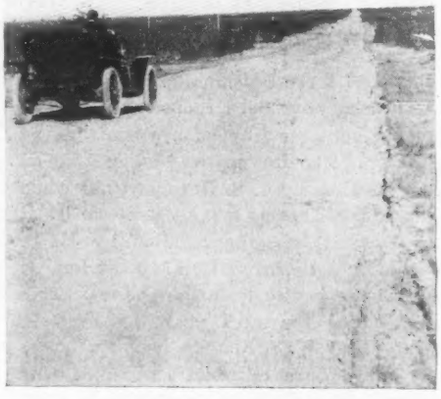
According to our road census we have less than 40,000 miles of stone surfaced road, or about 2 per cent of the total mileage; we have 108,000 miles of gravel road, or about 5 per cent of the total mileage. Small as our annual expenditure for roads has been, it has aggregated, during the 30-year period from 1870 to 1900, a total of upwards of $1,800,000. We may, therefore, say that road building in the United States is, considering area, population and wealth, at the same point at which it stood 30 years ago, and the seventeen hundred and odd million dollars have produced few appreciable results.

When we turn to the subject of road administration we find that in England, where about half of the states are operating under practically the same road laws as prevailed in England when America was a colony. This system of road administration provides for the payment of road taxes partly in labor, and localizes the work to an extreme degree, by placing in authority the district or township road overseers, or road supervisors, no requirement being made to insure skill or knowledge of road building on the part of these petty officials. With few exceptions no system of accounting is in force so that an intelligent idea may be obtained as to the disposition of the road tax, and no definite lines of authority are established such as would guarantee the wise and equitable conduct of the work.

This is a system which prevailed in all the states until less than 20 years ago. It is, therefore, easily understood why, at the present time, the concrete results in the matter of road building are so few, are confined to a comparatively recent period and are located in those states which have broken away from the inadequate and ineffective system which I have just described. It can also be understood why, at the present time, road work in those states who have clung to the old methods and the old system is conducted in a wasteful, intermittent and wholly ineffective manner, productive of no good results.

Road administration has either been placed on a sound and practical basis, or steps taken in that direction, in about half of the states of the union, comprising the New England states, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, Ohio, Michigan, Illinois, Wisconsin, Minnesota, Missouri, Kansas, California and Washington. These states have adopted in principle or practice, or both, the system of centralizing under a state highway department the conduct of all or part of the road work of the state, thereby securing uniformity in methods, economy in administration and skill in supervision. In some of the state highway departments the work is educational and investigative, with a view to ultimately giving these departments administrative powers. Some of the states, notably Kansas, Missouri and West Virginia, have provided for skilled supervision in the counties, through the appointment of county highway engineers. In most of these states appropriations have been made from the state treasuries, or the aid of the state convict force has been given toward carrying on road work throughout the various counties.

It is not possible in a short paper to enter



TUCSON SPEEDWAY—A STRAIGHTAWAY

into a discussion of the various systems of state aid in effect in this country. Suffice it to say that the principle of state aid and supervision constitute the germ of the only road administration which has proven successful in other countries. This movement is gaining headway at a very rapid rate, and when we consider that it has been little more than a decade and a half since its inception, the fact that half of the states have adopted it in principle and have actually expended from state treasuries considerably over $56,000,000, we may well feel encouraged for the future of road building in this country.

The striking feature of the French road system is the skilled supervision provided in every grade of road work and in every unit of the administrative organization. The basis of the system is the school of roads and bridges, one of the finest technical schools in the world, maintained at the expense of the national government. In this school are trained the highway engineers to whom are entrusted the building and maintenance of the roads of France. The course of study lasts 3 years and the instruction is free.

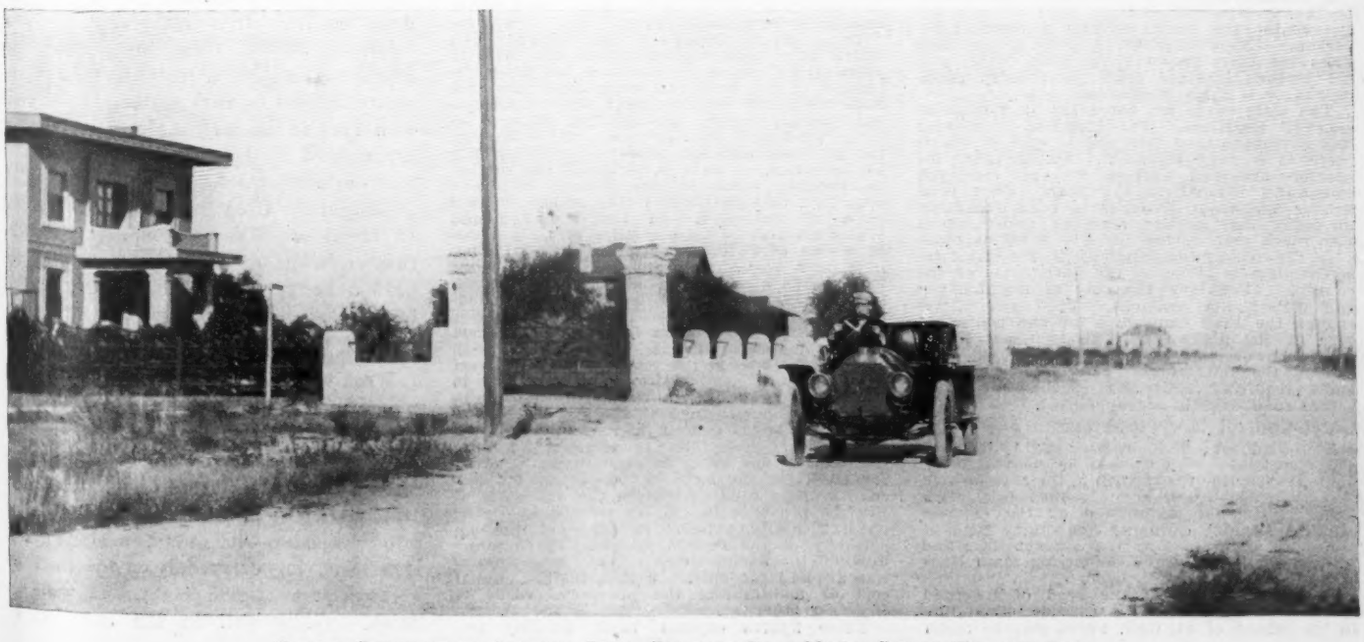
At the head of the administrative organization is an inspector-general of bridges and highways, under whom are chief engineers in charge of the road work of single departments and communes. Single arrondissements are under the direction of ordinary engineers and under engineers, the latter being equivalent in rank to non-commissioned officers in the army. The subdivisions are under the direction of principal conductors and ordinary conductors. Next in line come the foremen of construction gangs, the clerks employed at headquarters and finally the cantonniers or patrolmen, each having from 4 to 7 kilometers of highway under his immediate supervision. This great administrative machine working in complete harmony with definite lines of responsibility clearly established, accomplishes results with the precision and regularity of a great clock ticking off the seconds of time. Probably the most important unit in this great army of workers is the cantonnier, or patrolman, who has charge of a single section of the road. He keeps the ditches open, carefully fills holes and ruts with broken stone, removes dust and deposits of sand and earth after heavy rains, trims the trees and bushes, and when ordinary work is impossible he breaks stone and transports it to points where it is likely to be needed. He brings all matters requiring attention to the notice of his chief. Each cantonnier carries a little book in which the chief cantonnier notes his instructions and checks up the work accomplished. The conductors go over the line at regular intervals and direct the chief cantonniers, and all reports are transmitted to the central authorities, so that any day or any hour the exact condition of every foot of road throughout France may be ascertained. Every year the conductors prepare estimates of necessary expense for the next year, under three heads, namely, maintenance, heavy repairs and new work, and the parliamentary appropriations are based upon these careful calculations.

There are in France at the present time 23,656 miles of national routes, which cost $303,975,000 to build. There are 316,898 miles of local highways built at a cost of $308,800,000, of which the state furnished $81,060,000 and the interested localities $227,740,000. The roads of France are classified into five classes: First, national routes, traversing the various departments and connecting important centers of population; second, the department routes connecting the important centers of a single department and bisecting the national routes; third, highways of grand communication little less important than the previous class; fourth, highways of public interest traversing a single canton and connecting remote villages and groups of houses with the more important roads. Thus it will be seen that France has the idea well systematized.

There are at the present time 149,759 miles of road in England, from which the annual expenditures for the year 1905 to 1906 amounted to $78,059,000. It is, therefore, evident that the annual expenditure per mile of road amounts to about $520. In view of the fact that most of the principal roads of England have already been constructed, this large annual expenditure would appear to be devoted in a large measure to maintenance. It would seem that a system which required an annual outlay of $520 per mile for the entire mileage must be ineffective and costly. The explanation of this is found, perhaps, in the fact that in England the maintenance of the public highways devolves entirely on local authorities, these numbering about 1,900. Jurisdiction over the roads is vested in: First, the county boroughs; second, the county councils; third, the urban district councils; fourth, the rural district councils. The county boroughs are certain large towns which hold charters from the crown entitling them to the

Arizona Builds Motor Speedway In the Desert

Tucson, Ariz., Sept. 24—With the invasion of the southwest by the high-powered motor car has come a craving for speed. In Phoenix, the capital city of the territory, is held an annual state fair in November, an event which in years past called for broncho-busting and steer-tying contests and various kinds of rough riding which is part of the life of the majority of Arizonans. However, the order of things has changed considerably in Phoenix. The motor car has replaced the broncho and the tests of skill among the motorists stand far and above anything else that is billed as a feature of the fair week program. Not to be outdone by its rival sister city, Phoenix, Tucson has become enamored of the sport and is endeavoring to arouse an interest in motoring, particularly road racing. To this end a speedway has just been completed, the course lying over the desert and covering a distance of 15 miles. Several of the city's motor enthusiasts, not to be disheartened by the inactivity of the local dealers, started a subscription list and soon had sufficient funds to begin work on the course. Scrapers were immediately put into service, and after the course had been cleared of all desert plant life and scraped clean, a 4-ton roller was dragged over the road. The surface of the desert for miles around Tucson is hard, packed sand, under which is adobe soil, a combination which when rolled properly makes a splendid road surface. The summer rains aided the road builders and now that the course is completed it is the rendezvous for Tucson's motoring population. There is hardly a road in Arizona that is laid out straight. Most of the highways were formed by the driving across country of heavy teams which carried supplies to the various mining camps in the mountains. Naturally these roads would cross private ground. It was at first intended to make the Tucson speedway circular in shape. This would have meant encroaching on other than public property and would cause disturbed landholders to erect fences which would cross the course. In order to avoid this the road was laid out along section lines, running 7 miles to the east of Tucson, 1 mile south and 7 miles back into the city. Typical desert scenery lies at either side of the course. Now that the speedway is a fixture, Tucson's motor enthusiasts are forming a club, the purpose of which will be to promote racing in this part of Arizona. An effort is being made to have the drivers who are entered in the Los Angeles-Phoenix race, which will be held in November, continue on to Tucson, making this the finish. It is thought this will be done.



TUCSON SPEEDWAY IN ARIZONA—LONG, STRAIGHT ROAD MAKES SPEEDY HOMESTRETCH

TUCSON SPEEDWAY—ROUNDING A SHARP TURN

privilege of self government. In these the maintenance of the highways devolves entirely upon the borough or town council. In counties the maintenance of highways devolves upon urban councils in the urban districts, and rural councils in the rural districts. The only exception to the control of the urban and rural district councils is in the case of main roads which are highways between great towns, and the maintenance of these roads devolves upon the county councils.

Revenues are provided by district taxes except for the main roads, for the maintenance of which a county levy is made. The national government aids in the maintenance of the highways by a contribution proportioned to the sum raised by the imperial taxation levied in the different areas.

As to skilled supervision it may be said that no qualifications are required by law to be possessed by the men in charge of road building and maintenance, but it is the general practice in the important districts to appoint experienced highway engineers for this work. The English system lacks strong central control in each county, there being four different classes of government units, namely, the county boroughs, the urban districts, the rural districts and rural parishes. Although the county council exercises some control over the rural districts and the rural parishes, they exercise none over the other two units.

Germany's Many Systems

Germany is a federation of states, and it follows that road administration is conducted separately by each state of the empire. The imperial government exercises very little control over the highways, and does not in any way contribute to the expense of their construction and maintenance. The kingdom of Saxony may be taken as a representative state of the German empire. In Saxony the highways are divided into state roads, country roads and private ways. The state roads comprise those which have been built by the state and are maintained by the state. The county roads are generally termed communicating roads, and are built and maintained at the expense of the parishes through whose territory they lead.

A striking feature of the Saxon road system is the practice of planting fruit trees along the roads, the fruit yielding a considerable revenue. About $40,000 a year is obtained from the fruit grown along state roads, and the amount obtained from the country roads represents a much larger sum.

The state roads are cared for by a commission of engineers. The kingdom is divided into seventeen road districts, in each of which there is a road inspector. Under these inspectors are road masters, who are employed constantly throughout the year. Each road master has about 37 miles of road under his direction, and a road force of about fifteen men, each man caring for 2½ miles of road.

In the case of the minor roads, the direct responsibility is borne by the authorities of the county. They levy the cost of maintenance and collect the revenues. The communities engage the road employees for the continued care of the highways. The technical supervision, however, is exercised by the road masters of the state force. Strict provisions are made requiring skill and special knowledge before road officials are appointed.

Local Control in Switzerland

The road system of Switzerland is local in character; the various cantons having jurisdiction over the roads within their respective borders. The roads are classified into state roads—built and maintained at the expense of the respective cantons; community roads—built and maintained by the communities; and side, or auxiliary roads, connecting main lines of state or community roads.

Each canton has at the head of its road system an engineer with capable assistants. In the canton of St. Gall, which may be taken as representative, there are under the control of the engineers five inspectors or road masters, who are assigned to certain districts in the canton. The engineers and their assistants must have an academic education and possess a diploma from the Polytechnic Institute; and the road masters are required to have a good technical education.

Skilled Supervision Everywhere

It is apparent from the foregoing that although the units of administration in European countries range all the way from the localism of England to the highly centralized system of France, through varying degrees, skilled supervision is provided by all of the systems, as well as an ample cash revenue sufficient to enable the engineers to carry out adequately their plans for improvement and maintenance. England is the most striking example of extreme localization, and it is a significant fact that England is also the most striking example of lack of uniformity in road work and of excessive expenditure in proportion to mileage. It is also significant that the most perfect road system, conceded to be such by all authorities on highway construction, is that of France, admittedly the most highly centralized of all the road systems. France, with a total mileage of about two and one-third times that of England, expends about the same amount annually for maintenance. Certainly, the inference must be plain that centralizing makes for economy and efficiency in the administration of the public roads.

Maintenance Cost High

I desire to comment particularly upon what I consider to be the most important point which should engage the attention of American road builders and legislators at the present time, and that is road maintenance. In the years that have past by far the largest portion of our annual expenditures has been for maintenance of our unimproved roads; a maintenance which may justly be considered a mockery, for it has been a maintenance of the roads in almost their primitive condition. Now that we are actually building roads which compare with the best of Europe, it is of the gravest importance that we make provision for safe-guarding and maintaining these roads built at so great an expense.

In a careful study of the highway laws which have been enacted within the past 15 years, I find almost no provision for the maintenance of the roads, although large sums are authorized for construction. The erroneous impression generally prevails that when a so-called permanent road is constructed it is there for all time, and the expense has practically all been met. I have investigated the cost of maintaining roads in the leading European countries, and the figures may almost be said to be a revelation. In 1901 England and Wales maintained 26,598 miles of main roads at a cost of $370.34 per mile. In 1907 England and Wales maintained 27,556 miles of main roads at a cost of $446.74 per mile, or, in 6 years, the cost of maintenance had increased $76.10 per mile—an increase of over 20 per cent. In France the increase in cost of maintenance of the national roads has been about 5 per cent in the same period. The cost of maintaining main and suburban roads in England and Wales in 1905 and 1906 was $440.47 per mile. In France the cost of maintaining all roads during 1904 was $243.33 per mile. While these last figures are not strictly comparable, one being for 1904 and the other for 1905, yet the mere fact of 1 year's difference in time fails to explain the difference of $197.14 per mile in cost of maintenance—the natural inference being in favor of the superiority of the French system. In Germany in 1906 the average cost of road maintenance was $214.13 per mile. In Belgium the annual cost of maintaining the provincial roads is $277 per mile.

These figures express most forcibly two facts: first, that even the best of improved highways are not self-maintaining; second, that the cost of maintenance varies tremendously with the degree of centralization of the administrative organization which has the roads in charge. France with its most highly centralized organization is maintaining her roads at about 54 per cent of what it costs England and Wales with a very local and loosely centralized organization. Furthermore, the alarming increase in the cost of maintenance has been far more rapid in the countries with local and poorly organized systems of highway administration. We have just seen that although the rate of increase in maintenance from 1901 to 1907 in England and Wales was over 20 per cent, it was only about 5 per cent during the corresponding period in France. In England the maintenance is often intermittent and varies with the ideas of the local administrative units; in France the maintenance is continuous and highly specialized.

Many of our states have spent and are spending large sums of money on their highways with but little thought or provision for maintenance. This, if the experience of European countries is of any value, must prove disastrous in two ways. First, granting that the roads constructed at so great cost will not be allowed to go entirely to ruin, the cost of maintenance will be higher the more local and loosely centralized the organization for maintenance; and, second, systems of intermittent maintenance are sure to increase in cost from year to year as they have in Europe. It is high time that our legislature take note of these facts and provide ways and means so that our roads once constructed can be maintained efficiently and economically and not allowed to go to ruin, and that exorbitant sums need not be expended on fruitless efforts to maintain them unsystematically and in an unscientific manner.

It must also be evident from a study of expenditures in Europe that our road revenues are entirely inadequate. Although $80,000,000 seems a large sum, it is only about $38 per mile to meet all new construction, bridge building and every class of maintenance. We need, and must have, more money for roads, definite provision for maintenance, a system of continuous repair and a centralized, skilled supervision.

MUNSEY TOUR FINISHED

(Continued from page 5.)

more—the first peep of his beloved face vouchsafed the damp travelers for nearly or quite a whole week..

From Freehold south the roads were fine and generally level, and it is to be feared that Jersey's speed laws were badly bent, if not fractured. Similar conditions obtained from Atlantic City to Camden, and the distance was covered in jig time. The tourists were glad to get back in Philadelphia again, as they recalled that it had rained almost constantly since they had departed from that latter city one week before. Apart from infrequent tire troubles there were few delays, and the entire line-up of cars which started from New York in the early morning were safely tarpaulined in the city hall courtyard before dark.

Tonight the tired travelers are the guests of the local Munsey people at Keith's theater, while at the Quaker City Motor Club a buffet lunch and conversazione is in progress.

Seventh Day—Philadelphia to Washington

Washington, D. C., Sept. 30—Special telegram—Real Philadelphia weather prevailed to-day, clear and cool, with a little dust on the shell roads approaching Baltimore and on the home stretch. The little Hupmobile is reported to have hobbled into the Quaker City today, constant clutch trouble having delayed it on the road the greater part of the night. It will not finish. While still in the outskirts of

Philadelphia Maryland No. 11 striped its differential and went down and out for keeps after a long and plucky struggle by Driver Behrens to keep his car in the running. Behrens is a favorite with the tourists, and his continued ill-luck, with his perseverance under the most trying circumstances, has gained him the sympathy of all.

The Autocar truck, after being compelled to wait at Providence for a new wheel from the Ardmore factory, got going again Tuesday morning and reached Philadelphia this morning. Driver Thatcher started in pursuit of the run at 8 o'clock.

VANDERBILT BLANKS OUT

New York, Sept. 28—Entry blanks for the Vanderbilt cup race on Long Island on October 30 were issued today, and simultaneously officers of the Motor Cups Holding Co. were arranged for. The last obstacle in the way of the race was removed when word was received from Buffalo that the A. A. A. contest board had granted a sanction for the event. Already arrangements are under way to get the course in readiness, and preparations are being made for the sale of grand stand seats.

MAXWELL WINS IN TEXAS

Houston, Tex., Sept. 28—Special telegram—Jesse Illingsworth, driving a 28-horsepower Maxwell, the entry of the Maxwell-Briscoe-Handley Co., of Dallas, won the Houston Post reliability trophy, making the 535-mile cross country run and arriving in Houston yesterday afternoon with a perfect score. While due credit must be given to the Maxwell car, there is not the slightest doubt but that it was the headwork of Illingsworth, a Glidden tour driver for the Maxwell people, that brought the car in without a penalty. It was a very creditable day for the Maxwell cars, for the second place in the run was awarded to a 22-horsepower Maxwell, driven by G. W. Hawkins, of Houston, but 1 point being assessed against him. The final standing is as follows:

Car	H.P.	Driver	Score
Maxwell	28	J. Illingsworth	Perfect
Maxwell	22	G. W. Hawkins	999
Jackson	40	W. McCalip	998
Stearns	60	S. Brady	992
Reo	22	W. Guillaume	969
Buick	22	H. Petit	969
Maxwell	10	G. Nottingham	*
Brush	7	O. G. Smith	*

* Did not finish

The Maxwell Junior, entered by L. F. Birdsong, San Antonio, and driven by George Nottingham, had a score of 994 up to Friday night. The car had not arrived up to midnight of the 28th and so the penalty has not been decided. The Brush runabout, entered by the Palace Auto Co. and driven by O. G. Smith, was withdrawn after a breakdown resulting from a collision with a hidden stump at McDale, Tex. The penalty at the time of the withdrawal was 180 points.

One of the features of the run lies in the fact that while the road was new to every driver and that every variety of road from sand to shell was tried, there was no penalty attached except in the case of the Buick for anything that would materially injure the cars or keep them from active service. The penalties were in most instances assessed for slight omissions and transgressions from the rules. The Brush suffered the most serious damage, while the breaking of the steering shaft of the Buick necessitated it being run into town with rope steering lines. It arrived on time, however. The route from Houston lay west to Victoria, north to San Antonio, northeast to Austin, east to Brenham and southeast to Houston. The cars started at 6 o'clock Friday, September 24 and finished this afternoon.

Cadillac and Franklin Kansas City Winners

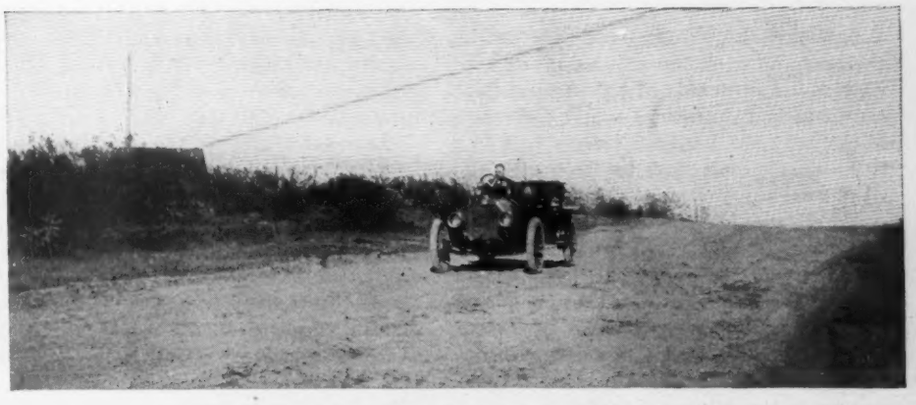
Kansas City, Mo., Sept. 27—Winners in the reliability run promoted by the Kansas City Star were announced today, the decision of the judges giving first place in the dealers' division to the Cadillac which was driven by R. C. Greenlease, while in the owners' class, D. E. Gudgel, who drove a Franklin roadster, was given first place. Other cup winners were: Franklin No. 1 in division 1, the Ajax cup; Great Smith No. 11 in division 2, the Studebaker cup and Reo No. 27 in division 4, the Auto Life cup. Only eight cars in the dealers' division were given a technical examination at the finish of the run and the Cadillac went through this without a single point being registered, which made it a winner with a perfect score. The No. 4 Franklin was found to have two loose fender bolts and one loose lamp, so, counting its road penalization of 3 points, it was demerited 9.1 points. No. 20 Rambler was given 22.4 points for a broken rear seat board, four loose fenders, 10 minutes' labor while adjusting a spring bolt and the purchase of the spring bolt. No. 11 Great Smith was marked 23.5 points for a loose fan belt and pulley, two bent steering knuckles and labor. No. 8 Marmon was ranked fifth with 30 points, 25 of which was for towage and the other 5 for a damaged running board. No. 24 Mason was penalized 33.25 points. It had an aluminum strip missing on the dash, the horn brackets were off, gas lamps broken, fenders were loose, seven screws were missing, one front spring clip broken and a fender bolt was loose. No. 25 Jackson had two damaged brake levers and a bent front axle, which gave it 43 points. No. 27 Reo got 18 points for a missing set screw, a damaged radiator, a loose spring bracket and a broken seatboard, raising its total to 608.7 points. It, however, was the only car in division 4 to finish without disqualification.

FIRE AT KISSEL PLANT

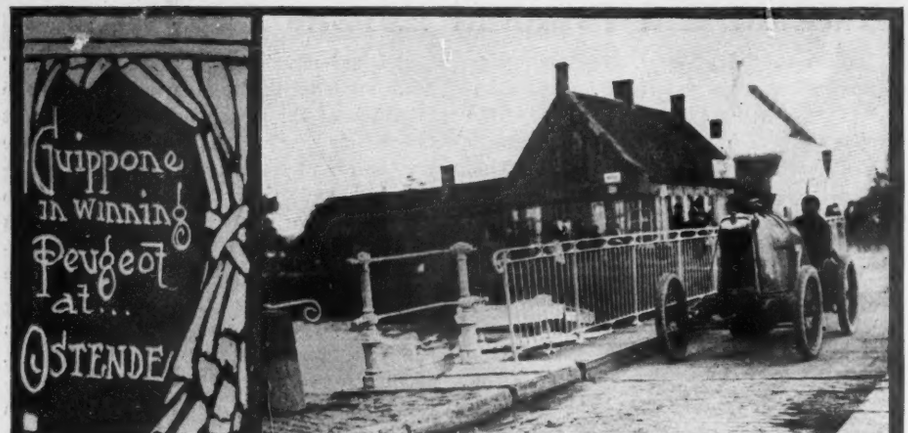
Hartford, Wis., Sept. 27—Three buildings of the Hartford Plow Co., which forms a unit of the extensive Kissel interests, were badly damaged by fire on Saturday. The power plant, the shop and a warehouse containing about 100 bodies for Kisselkars, were damaged to the extent of $25,000. The destruction of the entire Kissel Motor Car Co. plant was threatened for a time. The fire will not delay the Kisselkar output in the least. On Sunday the company arranged for power service from the city of Hartford and on Monday morning all departments were at work as usual. The motor works have enough bodies on hand to keep up the present production without delay. The loss is covered by insurance. The buildings will be reconstructed at once.

SOCIABILITY AT SYRACUSE

Syracuse, N. Y., Sept. 25—The Syracuse Herald held a sociability run today. More than 100 cars were sent away, beginning at 1:30 o'clock. The course led through the pretty villages of Manlius, Cazenovia, Chittenango and back to the city, a distance of 54.7 miles. The secret time as set by Mayor Alan C. Forbes was 3 hours, 2 minutes 9 seconds. The winner was L. Vinney, of Syracuse, in a Peerless car in 3 hours 2 minutes 1 second. Charles Ludwig in a Cadillac was second in 3 hours 1 minute 28 seconds. The woman's prize went to Mrs. Luke Kellogg in a Buick, who covered the distance in 3 hours 5 minutes 11 seconds—close figuring indeed.



TUCSON SPEEDWAY—ONE OF NUMEROUS ROLLING HILLS



Victory in Ostende Race Completes Lion-Peugeot's String of 1909 Victories

BRUSSELS, Sept. 15—With the running of the voiturette race yesterday afternoon the second meeting of the year at Ostende came to an end, and incidentally served to confirm the opinion of sportsmen that, this year at least, the Lion-Peugeot cars have been pre-eminent in a racing way in Europe. To win one or two races during the long season is a good record, but to start with the same cars in all of the important races of the season and win them all—the Florio, the Catalogne, the Normandie and L'Auto contests—is out of the ordinary and without precedent in the motor road racing sport. In the Ostende race yesterday Guippone in the Lion-Peugeot won, averaging 54.7 miles per hour.

That this Belgian small-car race was by no means an easy one will be appreciated when it is known that of eleven cars which started only two finished the full distance of the race, 249.6 miles. Twelve laps of a 20.7 miles circuit had to be made, and when the race was just half way only five cars were running. A worse course hardly could have been chosen. Yet it could have been worse. The roads had been put in the best condition possible. In some places attempts were made to make the route dustless, and for that purpose westrumite was used. But there were cobble stones that made the driving a hardship.

This was the second day of the races, the one with the big attraction on the program, yet there was a much smaller crowd than on Sunday, the 12th, when only five cars started. The weather was to blame though, and prevented the drivers making as good time as they could. The wind blew strongly into their faces, and at times there were downpours of rain, which made the onlookers run for shelter in the scores of cabarets, or little saloons, which were located at the start.

Fifteen voiturettes were entered in the small-car race yesterday, but four were scratched. The eleven which started were as follows: A monocylinder Crespelle, the bore and stroke being 4.3 by 7.1 and having Giraud at the wheel; a monocylinder Corre-La Licorne, 4.1 by 8.3, Collomb driving; two four-cylinder F. I. F. cars, 2.5 by 4.7, with Masson and Lamacq driving; a monocylinder Le Gui, 4.1 by 8.3, with Thomas as driver; a four-cylinder Alcyon, 2.5 by 5.5, with Barriaux at the wheel; two monocylinder Peugeots, 3.9 by 9.8, with Giuppone and Boillot as drivers; a two-cylinder Peugeot, 3.1 by 7.5, with Goux driving; a monocylinder Darras, 4.1 by 8.3, driven by Lormelle, and a two-cylinder two-cycle Cote, 5.5 by 4.7, driven by Koechlin. The cars were started at an interval of 1 minute.

During the first lap the cylinder of Boillot's Peugeot cracked, and he was out. During the initial round Barriaux and his Alcyon also were put out of the race by the breaking of a rear wheel. Giuppone was the leader at the end of the lap, having made the 20.7 miles in 20 minutes 55 seconds. The Corre-La Licorne was second, 32 seconds slower, and the Peugeot with Goux at the wheel a close third. The F. I. F. driven by Lamarcq gave up soon after having completed the first lap, owing to engine troubles.

When the second round was completed Giuppone was leading still, having gained 5 seconds more over the Corre-La Licorne, while the second Peugeot had lost some time, and had been overtaken by the Le Gui. During the third lap Giuppone met with a slight mishap, a spring attachment breaking, giving the Corre-La Licorne the lead. The time for 3 laps or 62.1 miles of this car was 1 hour 4 minutes 32 seconds. During the fourth lap the Corre remained well in the lead—6 minutes 18 seconds—ahead of the Giuppone-Peugeot, which had slightly over 5 minutes the better of the Le Gui and the Darras. Soon after the fifth lap had been started the Masson F. I. F. became mechanically tangled up, and that was the last heard of the combination. The Corre racer finished its 5 rounds —103.5 miles—in 1:47:51, having 5 minutes 37 seconds advance over Giuppone, but on the next lap the Corre turned turtle and was out.

The Crespelle car stopped within a few feet of the grand stand before finishing its fifth lap, owing to a leak in its gasoline tank. Over an hour was required to make the repairs, and then the car restarted, but a few miles out in the country it was put out of running through the breaking of a rear spring.

At the end of six laps Giuppone was leading, while Goux had taken second place from the Le Gui, the Darras being fourth. After this lap the two-cycle Cote dropped out of it, being nearly 2 hours behind the leader. This left four cars in the race when the seventh round started, at the end of which there was no change in the positions. The eighth lap was gone through without mishap by Giuppone, Thomas and Lormelle, but of Goux nothing was heard, he having been put out by tire trouble. This left one Peugeot, one Le Gui and one Darras in the running. The three cars made the ninth lap, but during the tenth the Darras broke a wheel and turned turtle without anybody being injured. This left the Le Gui and Peugeot. Giuppone won the race by a margin of 5 minutes 58 seconds, in 4 hours 33 minutes 28 seconds, having averaged 54.7 miles per hour. The fastest lap was made by the Corre-La Licorne, when it covered its fourth round in 19 minutes 53 seconds. The Peugeot of Giuppone was fitted with a Kempshall tire,

The Sunday race, which was in reality three races in one, was not devoid of interest, and at times of great enthusiasm and excitement, although fewer than half a dozen cars started. For the de Liedekerke and Williams cups there were three starters, two Viviniuses, driven by Jules Fischer and by A. Christiaens, and one Adler, with Wilhem at the wheel. For the Ostende cup contest an Imperia driven by Sabbe and a Miesse with Schollens at the helm were the starters. These cars had to cover twelve times the circuit of 20.8 miles, or a total distance of 249.6 miles. On the first lap No. 3, the Vivinius, driven by Christiaens, covered the circuit in 18 minutes 5 seconds. Think of it—20.8 miles on a course which for nearly three-quarters of the distance is badly paved! That lap was made at an average speed of 68.6 miles an hour, which was to remain untouched, and will probably remain the record for a long time. Favorite Fischer, who started 4 minutes ahead of Christiaens, finished his first lap 1 minute 21 seconds slower than his team mate. The latter had to make a stop on the road during his second lap to make an adjustment, and his time for the two rounds was 51:34, while Fischer's time was only 47:34. Christiaens, after having made his adjustments, started off again at record-breaking speed, and for eight laps went at an average speed of over 100 kilometers per hour. During the eleventh lap something went wrong with his motor and laid him up close to 1 hour. It was lucky for him that at that time he had about 50 minutes' advance over Fischer, as otherwise he could not have had a chance. When finally the car was again in shape and Christiaens passed the grandstand at great speed, he was cheered by the crowd. It was not however, until the official time had been recorded on the score board that the excitement started to run high and that the race became of great interest. The time record showed that after this eleventh lap had been finished by both drivers, Christiaens only had about 45 seconds' advance over Fischer.

Fischer succeeded in cutting down his rival's advance, and finished his twelfth lap ahead of him, but Christiaens still had 19 seconds to spare, and won the race in 4 hours 54 minutes 38 seconds, averaging 50.8 miles per hour. Fischer's time was 4 hours 54 minutes 57 seconds.

The race for the Ostende cup was won by the Imperia car, the Miesse dropping out at an early stage of the event. This event was open to cars of the touring type and having a maximum bore of 3.5 inches. The de Liedekerke trophy, which the Vivinius concern won, was contested for by cars having a maximum bore of 4.1 inches and weighing with their body not less than 2,090 pounds. The two Vivinius had four-cylinder motors, 4.1 by 4.7.

Foreign Motor Car Situation as Seen By Roy Chapin and James Couzens

DETROIT, Mich., Sept. 27—That the motor car manufacturer of the United States gives his patrons more car for less money and builds it, as a general rule, better than his brother manufacturer of Europe is the consensus of the opinion of Roy D. Chapin, general manager of the Chalmers-Detroit Motor Co., who has just returned from a trip abroad, during which he inspected virtually all the large European factories. Mr. Chapin believes that the European manufacturer is burdened with a heavy handicap, not felt on this side of the Atlantic, his great difficulty being the limited class from which the buyers are drawn. None but the wealthy aspire to be owners of motor cars, he says, the result being that where an American manufacturer makes thousands of cars his European rival makes hundreds. The manufacture of cars in large lots, as conducted on this side, is unknown in Europe and the European manufacturers were staggered at his statements regarding the output of the American factories.

"In Paris, London and Berlin the taxis simply were everywhere," said he. "The initial rate, as they term it over there, I figured out in American money at from 15 to 16 cents—a figure at which the taxicab owners make a profit, while the public found the low rate very acceptable."

In his progress about the European factories Mr. Chapin noted a general tendency to cars of small horsepower with enclosed bodies. The six-cylinder motor seems to be losing ground in Europe, he says. Standardization is gaining ground. Cylinders are now almost invariably cast in one piece abroad.

James Couzens, secretary and treasurer of the Ford Motor Co., has returned after a 6 weeks' trip to England, France, Germany and Switzerland. He says that American cars to be sold on the other side will have to be pushed in energetic fashion, for the trade there isn't nearly as encouraging as it is in this country now. He says: "No American maker should look for foreign trade with the idea that it is going to be obtained easily. Although one always likes to take an optimistic view, I don't like to say that there is going to be a rush for our American cars over there when such a statement would be deceiving. There is an opportunity abroad to sell a great many American cars, and the number to be sold will constantly increase. In order to obtain the business, however, conditions over there must be carefully considered and trade cared for in European fashion. The French makers are looking for an increase in their tariff as a protection for their industry."

The Readers' Clearing House

GRADE CROSSING ACCIDENTS

ROCKFORD, Ill.—Editor Motor Age—We read the editorial in Motor Age relating to grade crossing accidents and cannot see that the placing of the signs in a more prominent position will materially help matters. Frequently when riding with others we have had the driver look quickly when approaching the crossing—there has not been any real difficulty in discerning the rails stretching across the road entirely aside from the sign—and never stop unless there was some actual train coming near, and even then in spite of our protests he has clipped across and turned around with a self-satisfied look as though to vindicate his "better" judgment. Is not that the case with 99 per cent of the collisions—the taking of a chance instead of following out the injunction, "Stop, Look, Listen." Campaign this immediate rule as an absolute remedy for the deaths that are sure to come instead of looking to the indefinite moving of the signs so that they may be more easily discerned. All the signs, signals, gates, flagmen in the world will be of small avail unless the drivers are afraid to take chances by being warned, warned, warned.—La Verne Cole.

THE REALM OF SPECULATION

Washington, D. C.—Editor Motor Age—The question of the speed of ignition of explosive mixtures came up the other day in a discussion with a manufacturer of gasoline engines, but was not at all settled. I would like very much if Motor Age would open a discussion on this subject in the Readers' Clearing House, with the idea of finding out what are the principal factors which influence the speed of ignition. The specific problem which is before me is as follows: A cylindrical volume of explosive mixture, 4 inches in diameter and 1 inch deep, one part of gasoline vapor to ten parts of pure air, is under a pressure of 75 pounds gauge. If this is fired by a spark at one edge of the cylinder, how long will it take for the maximum pressure to be reached, assuming a constant volume? It was my understanding that the velocity of the flame under such conditions was very high—in the neighborhood of 10,000 feet per second, and that the necessity for advancing the spark at high speeds lay principally in the slowness of the ignition mechanism, rather than in the slowness of the actual ignition of the charge. Of course, it is an admitted fact that the ignition of impure charges is not instantaneous, but that does not enter into the present discussion, since the charges are always free from all exhaust gases, in the case under consideration.—Rolf Thelen.

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

No instrument has ever been devised such as would measure the speed of flame propagation of mixture in the cylinder of a motor. Motor Age knows, however, that the best results are obtained when the spark is advanced about 30°, when the size of the motor is approximately 4 inches bore, assuming piston speed of 1,000 feet per minute. How much of this 30° is due to electro-magnetic trouble can only be surmised. In your case, since you ask for definite information, it is difficult to see how you will be able to use that which we have to offer in terms of spark advance. Possibly you will be able to suggest a means for determining the rate of flame propagation?

W. A. Stiles, of the Atwater-Kent Mfg. Works, in analyzing the speed of exploding gas, says: "It is difficult to decide a specific problem regarding the cylindrical volume of explosive mixture 4 inches in diameter and 1 inch deep, one part of gasoline vapor to ten parts of pure air, under 75 pounds,—when fired by an electric spark. We doubt very much whether this could be calculated very accurately, as the space of time consumed in the complete expansion is very small. We suppose, however, that a fairly accurate result could be obtained by a manograph card, which would have a measured range of spark advance and the engine running at a certain speed. With these two known factors the card could be divided and gotten down as closely probably as in any other way.

"The writer has conducted several dynamometer and manograph tests on different ignition systems in connection with motor car engines, using in one particular test a Splitdorf vibrating set, an Atwater-Kent spark generator and a Remy magneto, the object being to ascertain the amount of time required after the closing of the primary circuit until the explosion took place,—and the intervening time may be attributed to the following causes: Lag of the building up of the core of the coil—vibrator coil system; reluctance in breaking down of the coil after the primary short-circuit has been broken; inertia of the vibrators in their movement, and lag in combustion of the gas. With the Atwater-Kent generator the conditions of vibrator inertia and coil lag in building up are of course eliminated, and the two things which will tend to make the spark late are reluctance of the coil in breaking down and, second, slowness of the combustion of the gas. This gives a spark which is synchronized rather than varying, and the spark does not require quite as much advance as the vibrator coil. With the magneto—true high-tension type—the factor of coil reluctance is eliminated also, and so the only question to be considered is time consumed in combustion of the gas. This time is in any case but a small, fractional part of the total time used by vibrators, coils, etc., but that the gas does require an appreciable amount of time has been conclusively demonstrated by the fact that two spark plugs set in opposite sides of a reasonably large cylinder will materially hasten the complete combustion of the explosive mixture."

ASKS ABOUT THE CAMERON

Massena, Ia.—Editor Motor Age—I would like to hear from owners of Cameron air-cooled cars, desiring to know if these cars do low-gear work for any length of time without overheating. According to the specifications the Cameron car is my ideal of motor car construction. Why does a car have to weigh so many pounds according to the cylinder dimensions in order to enter races, thus barring such cars as the Cameron, Franklin, and other cars of light weight unless the necessary weight is made up in ballast.—H. L. C.

Readers of Motor Age familiar with Cameron cars or users of such cars are invited to forward their opinions to this office and the same will be forwarded to the inquirer. The Manufacturers' Contest Association decided on the minimum weight of cars for certain races. This minimum weight was selected in order to bar specially-made racing cars of extremely light construction, the aim being to prevent freaks competing. It is a fact, however, that these minimum weights debar several standard stock cars, some of which you mention, which is a regrettable phase of the rules and one open to criticism.

POWER HORNS FOR STEAMERS

Belle Plaine, Ia.—Editor Motor Age—Will Motor Age give me some information on the following points: What power horns are there on the market which can be used to advantage on a white steamer? Is there not an electric horn on the market which obtains its sound from the vibration of a diaphragm, or which gives a sound resembling very much the present bulb horns?—C. A. Blossom.

The White company of Chicago has fitted a number of regular steam whistles to the exhaust of their cars for country driving. These were obtained from the Lunkenheimer Co., Chicago; but may also

be obtained from almost any dealer in engineers' supplies. There are a number of electric horns on the market, whose sound is produced by the vibrations of a diaphragm and which resembles to some extent the sound of the ordinary bulb horn. These may be obtained from any motor car supply house. Either may be advantageously used but the electric horn is the most popular of the two.

BATTERIES IN MOTOR BOATS

Roanoke, Va.—Editor Motor Age—Will Motor Age kindly inform us, through the Readers' Clearing House what makes of dry batteries can be used in motor boats? There seems to be no ordinary battery that will stand the dampness on a motor boat. The best of motor car batteries fail in about a month.—The Model Garage.

Surely there must be a dry place on the boat where the batteries can be conveniently located. Motor Age knows of no dry batteries that will give satisfactory service when subject to excessive dampness; but there is no reason why a set of dry batteries cannot be enclosed in a waterproof case, and kept thoroughly dry in this manner. It is customary with boats to suspend the batteries in some secluded spot where dampness has difficulty in reaching them. On many motor boats magnetos are being used, and not a few with low-tension ignition use a liquid cell battery because of the large amperage and low voltage it furnishes.

PREVENTS FRICTION SLIPPING

Chicago, Ill.—Editor Motor Age—I am the owner of an Earl car with Waite friction drive and have trouble with the slipping of the friction wheel. It might be that the fiber is worn down too much and too hard. Would Motor Age please inform me as to what I had better do and if Motor Age thinks I need new fiber, kindly tell me which is best and where I can get it.—Richard Wagner.

This slipping undoubtedly comes from the fact that there is some oil or grease on the driving disk or has been at some time. This can readily be removed by holding a piece of waste, saturated with gasoline, against the face of the disk, and allowing the motor to run slowly. If oil has been on the driving disk for any considerable length of time, it may possibly have glazed the paper fiber. If this is the case, the surface of the paper should be gone over with a piece of fine sandpaper or emery cloth to take off the glaze. If this does not cure the trouble let us know the exact results of your efforts to correct the trouble.

POINTS ABOUT ELECTRIC WIRING

Kansas City, Mo.—Editor Motor Age—Referring to the inquiry of L. Pfister, Clifton, Kan., regarding connections for storage and dry cells, in Motor Age, issue September 16. For the benefit of those who are not familiar with electrical wiring systems I wish to offer a few suggestions. Mr. Pfister asked why it is important that the positive poles of the storage and dry cells be grounded. It does not make a particle of difference whether the negative or positive sides are grounded excepting on cars equipped with metal battery boxes and where the boxes are connected to the frame of the car by metal brackets or are set on metal step boards. In that case it is essential that the negative poles of the batteries be grounded for the following reason: The zinc side of the dry cells is the negative pole and if this zinc should accidentally become grounded on the containing box through moisture or a protruding wire terminal the result would simply be to augment the ground connection on the motor frame. If the positive side of the batteries are grounded and a wire terminal should come in contact with the side of the metal box a direct short circuit would be established through the two grounds and the framework of the car. It is important that both positive, or both negative poles of the storage and dry cells be grounded. There also is no difference in the amount of current supplied to the coil whether the negative or positive poles are connected directly to it. The amount of current flowing would be directly proportional to the entire resistance of the circuit and direction of flow would not alter it in the least. If the battery boxes are of wood, or of metal insulated from the frame of the car so that no accidental ground could occur, either pole of the battery may be grounded. In that case it would be to the advantage of the owner to ascertain which contact on the coil is consumed first and so connecting the batteries that the cheaper piece would be used first. On most coils the screw with the contact point is the cheaper. In such cases it would be advisable to connect the batteries so that the screw contact would be positive.—F. L. Bauer.

ADJUSTING SCHEBLER CARBURETER

Hillsboro, Kans.—Editor Motor Age—Will Motor Age through the Readers' Clearing House, give instructions for setting a Schebler carbureter on a one-cylinder car.—J. F. Banman.

It is presumed that you are using a Model D Schebler. To adjust it allow the float chamber to fill, close the needle valve, then immediately open to five-eights or three-quarters of a turn. Retard the spark, open the throttle one-fourth so as to equal the size of the fixed air space and start the motor. This done adjust the needle valve in the nozzle until the motor runs smoothly without backfiring or missing. Next open the throttle wide, keeping the spark late, and by turning the air valve adjusting screw increase or weaken the tension of the valve spring until the proper running mixture is secured. If the mixture is too rich as shown by smoke, loosen the spring tension allowing more air to enter.

DRAKE ON THE MAP, TOO

Lexington, Ky.—Editor Motor Age—On page 13, Motor Age, issue September 16, we noticed an article entitled "Lexington on the Map," which we presume was written by some local man and who purposely or unintentionally failed to include our company in the list of motor car dealers. As a matter of fact a number of the dealers listed do not sell the number of cars that we do and doubt if any one of them have sold as many of any one make of cars as we have. Up to the present time we have handled the Overland car exclusively but expect to add one or two other lines within the next 30 days.—S. E. Drake Co.

MASTIC FOR FIXING CUTS

Tracy, Minn.—On page 44 of Motor Age, issue September 16, in an article entitled "The Care of Tires," reference was made to a special paste to be used as a filling for cuts, etc. Will Motor Age advise its readers the name of this paste and where made?—Subscriber.

The paste referred to in the article in question is what is known as the Michelin mastic, marketed by the Michelin Tire Co., Milltown, N. J.

INVESTIGATION DEMANDED

Montgomery, Ala.—Editor Motor Age—As an old subscriber, I desire to ask through the Readers' Clearing House, as to a purchaser's rights and protection against skin games. In ——— Weekly and the ——— ——— Post, there has been running for some time an advertisement of a concern in St. Louis, calling itself, the — — — Motor Vehicle Co. It even issues a catalog. On April 9th, the writer sent $186 to cover one-third payment on one of its cars, which it claimed to manufacture, and which from previous correspondence it led the writer to believe it had in stock and could ship promptly. Failing to hear from the company for several weeks, several letters were written it and telegrams sent and it finally stated it would ship the car in 30 days from date of letter, which would be May 9. After a number of letters it stated it would ship early in June. Again writing a number of letters and having a personal friend to visit the company, it stated it would ship in July. Several more letters were written and it stated it would ship July 15 or sooner. More letters were written and telegrams sent, whereupon the company requested that if a slight change could be made in the order it could ship promptly. Complying with its request to change the model, it now wrote " we

have this model in stock and will send it to the paint shop in a few days.''

Now what I want to know, is how can a man be protected against such grafters and swindlers without loss to himself? Is there such a concern. If not, why do such papers advertise them, and if there is such a concern why are they permitted to obtain and hold money by making so many false statements. The same concern wrote to a friend of the writer under date of June 6 and agreed to ship him one of their cars within 30 days but, of course, it did not then have his money. Your answer to the above will be appreciated and perhaps protect some of your readers from falling into the clutches of them.—F. C. Schwend.

The best solution of a problem of this nature is to inform the postal authorities at Washington, D. C., who are very active in punishing any manufacturers who abuse the mail privileges. There is no court records of complaintants securing recompense from such concerns.

MAKES VALVELESS MOTOR

Milwaukee, Wis.—Editor Motor Age—Regarding the inquiry of J. G. Bellis, in Motor Age, issue September 23, relative to the Wisconsin valveless motor. This motor is manufactured in Milwaukee, but the exact address is unknown to me. Would refer you to the Phillip Gross Hardware Co., 126 Grand avenue, Milwaukee, which concern had one of these motors on exhibition at its store some time ago.—W. P. Wegner.

QUESTION ON COOLING

Glasgow, Ky. — Editor Motor Age — Through the Readers' Clearing House will Motor Age tell me if a larger belt wheel on an engine, giving more motion to the fan, increase the cooling capacity of the radiator? Would a centrifugal pump increase the cooling capacity of the radiator over a gear pump?—A. Laney.

Increasing the speed of the fan by any means, so that more air is drawn through the cells of the radiator will increase the cooling capacity of the radiator. The wholesale adoption of the centrifugal pump in modern motor car design, in preference to the gear type of pump, naturally leads us to believe that the centrifugal pump is by far the more efficient of the two. By giving a greater speed to the circulation of the water, the centrifugal pump will increase the cooling capacity of the system. In an article of some length on the selection of a radiator, in the March 1 issue of Motor Age, Joseph E. Lewis states that: If the fan is running at less than twice the speed of the motor and the radiator does not cool sufficiently, the trouble may be alleviated or overcome entirely by speeding up the fan to two and one-half times, or even three times, the motor speed. Of course, when the car is traveling at a speed of 20 miles an hour or more, there is little benefit derived from the fan, but it is quite possible that

at this speed the fan may actually retard the passage of air through the radiator unless it is revolving at a speed which would correspond to an air velocity equal to that due to the motion of the car. The speed of the pump or the amount of water circulated per minute has an important bearing upon the efficiency of radiation. In the tests made by Mr. Lewis, the water was circulated at the rate of exactly 46 pounds per minute and the radiator was of a size suitable for a 24-30-horsepower motor. This is at the rate of from 1½ to 2 pounds of water per horsepower per minute. The drop in temperature between the inlet and the outlet of the cooler was 16½ degrees Fahrenheit at 1,000 revolutions per minute of the fan and 21¾ degrees Fahrenheit at 1,500 revolutions per minute of the fan. Generally speaking, the more rapid the circulation of the water the greater the radiation, and while it would not be possible, theoretically, to circulate the water too fast, the best practical limit is 3 to 4 pounds per horsepower per minute for motors up to 40 horsepower, and 2 to 3 pounds for larger motors.

CARBURETER EQUIPMENT

Exeter, Calif.—Editor Motor Age—Through the Readers' Clearing House will Motor Age inform me as to whether a standard make of carbureter, as used on most four-cycle motor cars, could be used on a two-cycle, three-cylinder Elmore. If such cannot be used, will Motor Age tell me what carbureter can be so used.—H. E. S.

The Schebler carbureter is used on several Elmore two-cycle cars with apparently very satisfactory results. The Elmore company regularly fits its own carburter which is specially designed for two-cycle engines.

CLEANS AIR INLET

Decatur, Ill.—Editor Motor Age—Through the Readers' Clearing House I would state the following: On cars using Kingston carbureters I find that occasionally good results are obtained by pouring kerosene into the air inlet to the carbureter when the engine is running at a high rate of speed. This partially cleans out the carbon in the engine and makes the engine run better. This is a good stunt on model T Fords.—R. B. M.

VALUE OF FOUR-WHEEL DRIVE

Reno, Nev.—Editor Motor Age—Given a standard type of motor, make it a four-wheel drive or two-wheel drive, either front or rear pair at the will of the driver, control same as the present type, material and construction equal to any in the market, engine and frame a matter of choice, wheels perhaps a trifle larger, not over 36-inch unless desired, would such a machine have any greater commercial value than the present type? Would the advantages be sufficient to create a demand for it? Has the opposed cylinder type of engine been tried and with what results?—Subscriber.

Do you refer to a pleasure car or a commercial vehicle? Experiments with four-wheel drive have shown this construction to have greater tractive force than two-wheel, but with gasoline machines the trouble has been to keep the weight down. With four-wheel drive and four-wheel steering it is possible to maneuver the truck in less space than where only two wheels are used for each. There would be a demand for such provided you got a satisfactory construction which would transmit power to a four-wheel without undue loss of same and would not be too heavy. The opposed type of engine has been used in America for years and is now used on not a few pleasure cars. It was the earliest type of engine used in this country, the earliest Haynes-Apperson models using such.

MASTER VIBRATOR STATUS

New Orleans, La.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions: 1—Are there any marked advantages in a master vibrator? I have a 20-horsepower, four-cylinder car operated by a magneto and unit coil system—a vibrator to each coil unit. I am told a master vibrator connected so as to shunt around the vibrator on the coil units will produce a more even operation of the engine and perhaps eliminate an occasional miss that cannot be traced to any other cause. 2—If a master vibrator is better why don't more cars apply them? 3—Give names of some good master vibrators, or names of makers.—Vibrator.

The master vibrator has been used on many foreign cars for several seasons. Last year was the first in which it was used to any extent on American cars. For next year not a few of the leading makes of cars are using master vibrators. One example of this is the Pierce six-cylinder machine in which a six-unit coil with a master vibrator is employed. This system was illustrated in Motor Age, September 16, page 24, which illustration shows the separate unit containing the vibrator which operates for all six cylinders. With a master vibrator there is bound to be perfect synchronization among all of the cylinders and it is certain that the spark will take place in all six cylinders, or four as the case may be, at the same time. The reason the master vibrator has not been used heretofore is that it has not received the attention in this country that it has in others. The coils used on the Pierce cars are manufactured by the Autocoil Co. A master vibrator coil is manufactured by C. F. Splitdorf. Motor Age is not aware at the present time of other concerns manufacturing coils of this nature but would like to receive communications from any who may.

ATLANTA REPORTS LIST OF EXHIBITORS

ATLANTA, GA., Sept. 28—That the citizens of Atlanta are determined to live up to their famous reputation of southern hospitality and make the Atlanta show a record-breaker and one to be remembered, is best evidenced by the manner in which professional and business men of the city are contributing to the fund to be used for entertaining the visiting manufacturers, salesmen, and others who attend the Atlanta show. Already over $15,000 has been received by the executive committee and by the time the guests begin to arrive this amount will be increased by many thousands.

For a city the size of Atlanta, it means a hard task to house the great influx of visitors who will attend the show and to meet this exigency a public comfort department has been created, with S. C. Dobbs, of Atlanta, as chairman. This department will find temporary homes for those attending the affair. A general call has been sent out to the citizens of Atlanta to open their residences to the guests, and hotel proprietors are making every effort to increase their facilities.

Invitations will be sent out to every dealer and garage proprietor in the District of Columbia, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Texas, Alabama, Mississippi, Louisiana, Arkansas, Missouri, Kentucky and Tennessee.

In addition to this list, which number about 1,100, will be issued invitations to all carriage dealers in the same states, swelling the number to about 2,000. The courtesies of the show will be extended to these dealers gratuitously. As is well known the show is being held at the time of year when money is free in the south. The list of exhibitors at the show is as follows:

Car manufacturers—Peerless Motor Car Co., Cleveland; Olds Motor Works, Lansing, Mich.; Pierce-Arrow Motor Car Co., Buffalo; Winton Motor Carriage Co., Cleveland; Woods Motor Vehicle Co., Chicago; Mitchell Motor Car Co., Racine, Wis.; H. H. Franklin Mfg. Co., Syracuse, N. Y.; Stevens-Duryea Co., Chicopee Falls, Mass.; Maxwell-Briscoe Motor Co., Tarrytown, N. Y.; Dayton Motor Car Co., Dayton; Packard Motor Car Co., Detroit; Pope Mfg. Co., Hartford, Conn.; Cadillac Motor Car Co., Detroit; Moon Motor Car Co., St. Louis; Cartercar Co., Pontiac, Mich.; Brush Runabout Co., Detroit; St. Louis Car Co., St. Louis; W. H. McIntyre Co., Auburn, Ind.; Selden Motor Vehicle Co., Rochester, N. Y.; Studebaker Automobile Co., New York; Jewel Carriage Co., Cincinnati; Speedwell Motor Car Co., Dayton, O.; Hupp Motor Car Co., Detroit; York Motor Car Co., York, Pa.; Overland Automobile Co., Indianapolis; Premier Motor Mfg. Co., Indianapolis; Thomas B. Jeffery & Co., Kenosha, Wis.; Reo Motor Car Co., Lansing, Mich.; White Co., Cleveland; Locomobile Co. of America, Bridgeport, Conn.; Mora Motor Car Co., Newark, N. Y.; Marion Motor Car Co., Indianapolis; Ford Motor Co., Detroit; Buckeye Mfg. Co., Anderson, Ind.; Dorris Motor Car Co., St. Louis; Bartholomew Co., Peoria, Ill.; Pennsylvania Auto-Motor Co., Bryn Mawr, Pa.; F. B. Stearns Co., Cleveland; Elmore Mfg. Co., Clyde, O.; Nordyke & Marmon Co., Indianapolis; Chalmers-Detroit Motor Co., Detroit; Knox Automobile Co., Springfield, Mass.; National Motor Vehicle Co., Indianapolis; Apperson Brothers Automobile Co., Kokomo; American Motor Car Co., Indianapolis; Jackson Automobile Co., Jackson, Mich.; Babcock Electric Carriage Co., Buffalo; Hudson Motor Car Co., Detroit; Austin Automobile Co., Grand Rapids; Moline Automobile Co., East Moline, Ill.; Metz Co., Waltham, Mass.; Baker Motor Vehicle Co., Cleveland; Streator Motor Car Co., Streator, Ill.; Sultan Motor Co., New York; Allen-Kingston Motor Car Co., New York; Renault Freres, New York; Columbus Buggy Co., Columbus; Fiat Automobile Co., New York; Black Mfg. Co., Chicago; Inter-State Automobile Co., Muncie, Ind.; Great Western Automobile Co., Peru, Ind.; Rauch & Lang Carriage Co., Cleveland, O.; Autocar Co., Ardmore, Pa.; Rapid Motor Vehicle Co., Pontiac, Mich.

Main floor—Badger Brass Mfg. Co., Fisk Rubber Co., Veeder Mfg. Co., B. F. Goodrich Co., A. W. Harris Oil Co., Electric Storage Battery Co., United Manufacturers, C. A. Mezger, N. Y. and N. J. Lubricant Co., Jones Speedometer Co., Connecticut Telephone and Electric Co., Weed Chain Tire Grip Co.

Mezzanine floor—G & J Tire Co., C. F. Splitdorf, Morgan & Wright, Hartford Rubber Works Co., National Carbon Co., Goodyear Tire and Rubber Co., Diamond Rubber Co., Firestone Tire & Rubber Co., Oliver Mfg. Co., Hartford Suspension Co., Gabriel Horn Mfg. Co., Republic Rubber Co., Joseph Dixon Crucible Co., Ajax-Grieb Rubber Co., Byrne-Kingston & Co., Kokomo Electric Co., Michelin Tire Co., Empire Tire Co., Federal Rubber Co.

Second floor—S. F. Bowser & Co., Sprague Umbrella Co., Herz & Co., Never-Miss Spark Plug Co., Leather Tire Goods Co., Dow Tire Co., C. A. Shaler Co., Randall-Faichney Co., Stromberg Motor Devices Co., Dayton Rubber Mfg. Co., High Wheel Auto Parts Co., Lavalette & Co., Adam Cook's Sons.

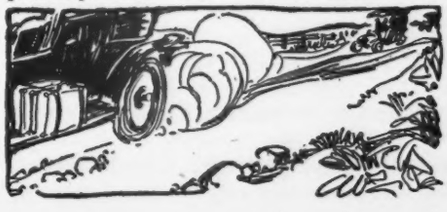
Accessories—Charles E. Miller, Post & Lester, Cloud-Stanford Co., Rutherford Rubber Co., Chicago Wind Shield Co., W. F. Polson, Vehicle Apron and Hood Co., Shipman Instrument Co., Ajax Trunk and Sample Case Co., Emil Grossman Co.

Motor cycles—Hendee Mfg. Co., Aurora Automatic Machinery Co., Consolidated Mfg. Co., Excelsior Supply Co., Greyhound Motor Works, N. S. U. Motor Co., Milton W. Arrowwood Co.

ATLANTA OFFERS BIG PRIZES

Atlanta, Ga., Sept. 27—Entry blanks for the opening meet of the new speedway are out and the card offered for November 9-13 shows considerable thought and is well-balanced. There are thirty-two events in all on the bill, four of which are long distance races. The Coca Cola trophy is offered for event 5, which is a 200-mile stock chassis contest of the 301-450 division. The trophy has to be won three times and in addition there is a prize of $600 for first place, $300 for second and $150 for third. The Candler trophy is up in the 100-mile race for 161-230 stock chassis and the gold runs $600, $300 and $150. The Atlanta Automobile Association trophy is offered the 231-300 division in a race at 120 miles in addition to the splitting of $950 in coin among the first three. The big race of the meeting will be a 200-mile contest for the 451-600 division for the City of Atlanta trophy. In this the first prize will be $1,000 in cash, with $500 to second, $300 to third and $200 to fourth.

The meet will be remarkable for the value of the prize list, for in fifteen of the thirty-two races there are cash offerings which total $7,350. The amateurs are well cared for, there being four races for them. In one the prize is the Kreigshaber trophy, while another is for the southern championship. The next to the last race of the meet will be a 20-mile handicap for which are eligible only those cars which participate in the New York-Atlanta reliability run. The rules covering the meet are along conventional lines, with one exception—the use of armored tires or chains is forbidden. The full card is as follows:



1—One-mile time trials, free-for-all. First prize, cup; second prize, cup.

2—Ten miles, stock chassis, 161 to 230 cubic inches. First prize, cup; second prize, cup.

3—Ten miles, stock chassis, 451 to 600 cubic inches. First prize, cup; second prize, cup.

4—Ten miles, free-for-all handicap. First prize, $150; second prize, $50.

5—Two hundred miles, stock chassis, 301 to 450 cubic inches. First prize, Coca-Cola trophy, which must be won three times to become the property of entrant and $600 in gold; second prize, $300 in gold; third prize, $150 in gold.

6—Two miles, free-for-all. First prize, $100; second prize, $50.

7—Twenty-four miles, stock chassis, open only to amateur drivers. First prize, Kreigshaber trophy.

8—Ten miles, stock chassis, 231 to 300 cubic inches. First prize, cup; second prize, cup.

9—Twenty miles, free-for-all handicap. First prize, $150; second prize, $50.

10—Ten miles, stock chassis, 451 to 600 cubic inches. First prize, cup; second prize, cup.

11—One hundred miles, stock chassis, 161 to 230 cubic inches. First prize, the Candler trophy and $600 in gold; second prize, $300 in gold; third prize, $150 in gold.

12—Four miles, free-for-all. First prize, $100; second prize, $50.

13—Twenty miles, stock chassis, 301 to 450 cubic inches. First prize, cup; second prize, cup.

14—Ten miles, free-for-all handicap. First prize, $150; second prize, $50.

15—Ten miles, stock chassis, 600 cubic inches or under. First prize, $100; second prize, $50.

16—Ten miles, free-for-all, open to amateur drivers only. First prize, cup; second prize, cup.

17—Four miles, stock chassis, 161 to 230 cubic inches. First prize, cup; second prize, cup.

18—One hundred and twenty miles, stock chassis, 231 to 300 cubic inches. First prize, Atlanta Automobile Association trophy and $600 in gold; second prize, $300 in gold; third prize, $150 in gold.

19—Ten miles, handicap, open only to amateur drivers. First prize, cup; second prize, cup.

20—Twenty-four miles, stock chassis, 161 to 230 cubic inches. First prize, $100; second prize, $50.

21—Six miles, stock chassis, 451 to 600 cubic inches. First prize, cup; second prize, cup.

22—Ten miles, stock chassis, 231 to 300 cubic inches. First prize, $100; second prize, $50.

23—Twelve miles, stock chassis, 301 to 450 cubic inches. First prize, cup; second prize, cup.

24—Fifty miles, free-for-all. First prize, $500; second prize, $250; third prize, $100.

25—Ten miles, stock chassis, 161 to 230 cubic inches. First prize, cup; second prize, cup.

26—Ten miles, stock chassis, open to amateur drivers only for southern championship. First prize, cup; second prize, cup.

27—Six miles, stock chassis, 231 to 300 cubic inches. First prize, cup; second prize, cup.

28—Twelve miles, stock chassis, 301 to 450 cubic inches. First prize, $100; second prize, $50.

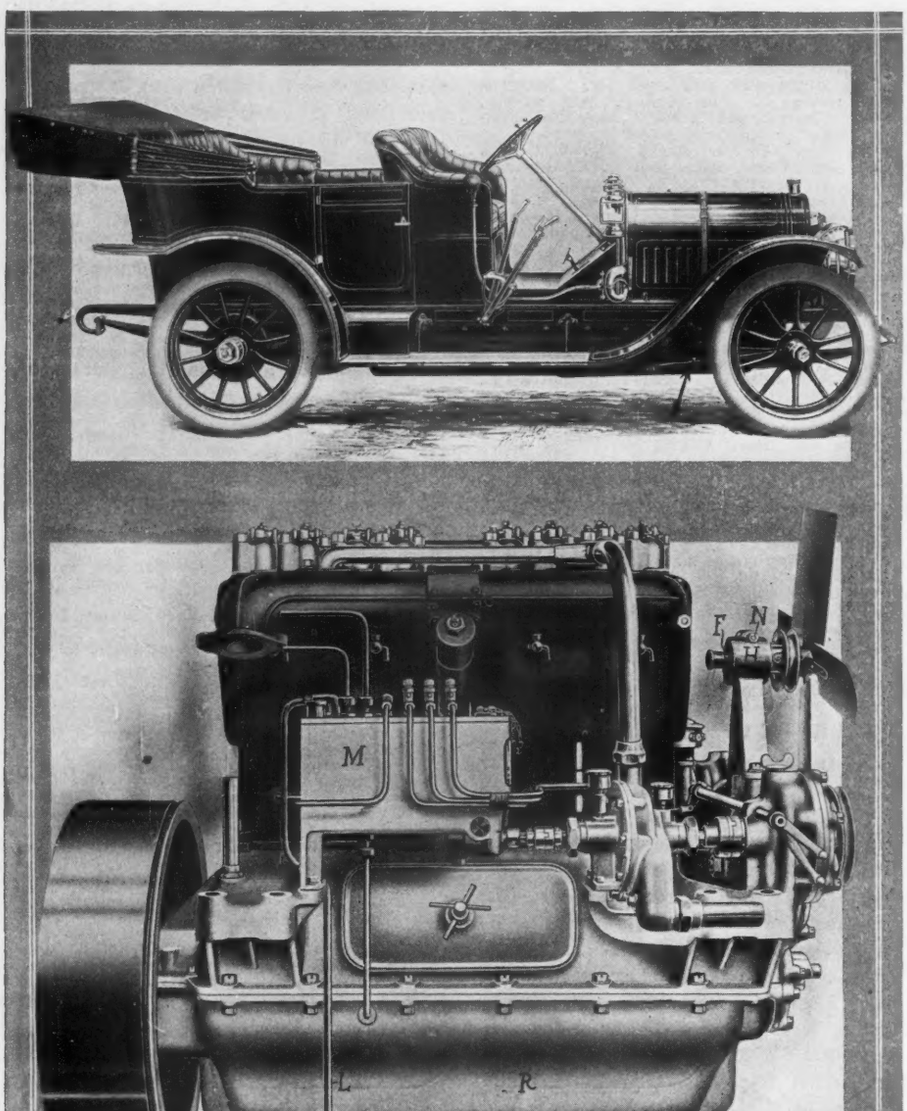
29—Eight miles, free-for-all handicap. First prize, cup; second prize, cup.

30—Two hundred miles, stock chassis, 451 to 600 cubic inches. First prize, the city of Atlanta trophy, which must be won three times to become the property of the entrant, and $1,000 in gold; second prize, $500 in gold; third prize, $300 in gold; fourth prize, $200 in gold.

31—Twenty miles, handicap, stock cars, restricted to contestants in the Constitution—New York Herald-Atlanta Journal tours. First prize, cup; second prize, cup.

32—Two miles, free-for-all, best two out of three heats. First prize, $200; second prize, $100; third prize, $50.

Motor Car Development



FIGS. 1 AND 2—POPE-HARTFORD CAR AND MOTOR

FOR 1910 the Pope Mfg. Co., Hartford, Conn., has added several improvements to its Pope-Hartford car, which, although not interfering with the general characteristics of the car, indicate that the company is operating along the one general line of improvement so conspicuous in American car manufacturing. The wheelbase has been increased from 114 to 118 inches, the 4 additional inches being used for lengthening the tonneau. Of chief importance to owners is the increasing of the tire size all around from 34 by 4 to 36 by 4 inches. From a power point of view there has been no change, the four-cylinder motor with $4\frac{5}{16}$-inch bore and $5\frac{1}{8}$-inch stroke being continued. There has, however, been an important change in the motor, namely in the lubricating system. This year the mechanical oiler, located on the right side of the crankcase, furnished oil to the cylinders from which the overflow supplied the splash in the crankcase for the remainder of the motor parts. For next year this same mechanical oiler M, Fig. 2, is located on the same part of the motor, but in conjunction with it a circulating system is established. The lower half of the crankcase R has been redesigned and now contains a 3-gallon oil reservoir which communicates with the crankcase proper by overflow pipes. Incorporated with the mechanical oiler is a suction pump which lifts the oil from the oil reservoir through pipe L to the mechanical lubricator whence it is ready to be recirculated to the motor parts. In the standpipes, or overflow pipes of the crankcase proper, are gauze strainers for filtering the oil before it enters the reservoir and is started on another circuit of the motor. These standpipes also serve to maintain a proper oil level in the crankcase into which the connecting rods dip.

A slight alteration in conjunction with the cooling system is an eccentric adjustment of the fan indicated at F, Fig. 2. In changing the tension of the fan belt the nut N on the pinching bolt is loosened, permitting the hub part H to expand, after which the eccentric holding the fanshaft bearing can be turned as desired. Again tightening the nut N maintains the adjustment. The characteristic of the Pope-Hartford radiator, with arched top and bottom and sides slightly converging toward the top, continues to be an easy method of distinguishing this car from other makes.

An option is given in the ignition system, the makers leaving it with the buyer whether a dual Bosch or Eisemann system is fitted. In either the dash equipment consists of a cylindrical casing containing the restarting mechanism. The spark plugs, as before, are located horizontally on the left side of the cylinders.

The structural design of the Pope-Hartford motor has not, with the exception of the lower half of the crankcase, been to any extent altered. A change in the lubrication of the timing gears at the forward end is that they are now in a separate compartment lubricated by packing with oil and grease. Last year the compartment holding these gears was common with the crankcase. In forming the compartment for these gears arrangement is made whereby the upper half of the crankcase is continued in the form of an integral housing, which gives compact design. The timing gears are now of steel throughout, whereas last year the fiber idlers were employed. Both intake and exhaust valves are located in the cylinder heads and are made interchangeable. The Pope-Hartford was one of the earliest exponents of the valve-in-the-head type of motors and never has deviated from this design. The increased efficiency of this construction has been demonstrated on many occasions by the work of this car in hill-climbs and other contest performances.

An alteration in the clutch is that in

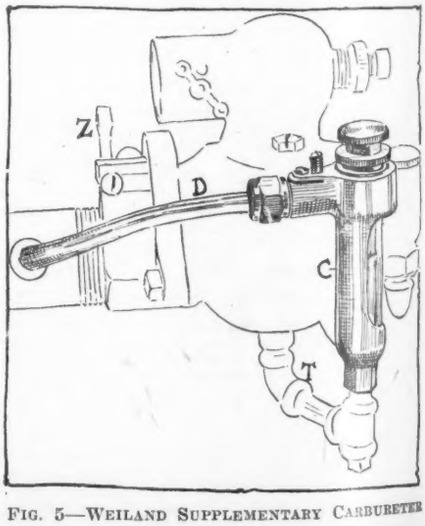


FIG. 5—WEILAND SUPPLEMENTARY CARBURETER

addition to the leather facing used on the cone, cork inserts are made use of. The selective gearset remains unaltered in general design and is characterized by the use of plain bearings for the shaft. Chrome nickel steel is employed for both gears and shafts. Transmission of power to the rear axle is through a propellershaft with two universal joints. The rear axle remains practically unchanged, excepting in that special alloy steel is used in the driveshafts instead of nickel steel of the present season. The axle is a floating construction with Timken bearings at the outer ends supporting the road wheel.

The Pope-Hartford braking system differs from that of many cars in that but three brakes are used—a regular external brake on the transmissionshaft at the rear of the gearbox, and one set of expanding brakes on the rear wheels. Fabric facings are used in these brakes. An alteration in the steering arrangements of the car is that the tie bar from the radius arm of the steering gear to the curved arm on the right steering pivot attaches to this arm above the front axle instead of underneath the axle as at present. This can be seen by the arrow, Fig. 1, pointing to the tie bar which, instead of hanging horizontally as at present, is inclined toward the front. This takes this important member of the steering system well up out of the danger zone. The steering gear as heretofore is of the worm and sector type. A 17-inch steering wheel is used. As this year so next, Timken roller bearings are used for carrying the front wheels. A slight change is that the muffler exit pipe, which formerly was beneath the rear axle, is now located above it and is of goose-neck pattern. The spring has been slightly increased.

WEILAND CARBURETER

The American Die and Tool Co., Reading, Pa., is marketing the Weiland supplementary carbureter which is an additional attachment which can be coupled to any standard make of carbureter and which is an additional spraying nozzle designed to give a richer mixture to a motor when starting and when pulling a load at low speed. Fig. 5 illustrates the device attached to a Schebler carbureter. It consisting of a vertical part C with a gauge glass showing the level of gasoline in the float chamber and within which is a needle valve. This attachment connects by the coupling T with the base of the float chamber and through the pipe D the additional mixture is supplied to the intake pipe at a point between the intake valve and the throttle Z, this being a part of the intake system where the motor suction is strongest. Fig. 6 shows the designs of the Weiland supplementary carbureter. On low speeds air enters at G and is drawn down within the needle valve to the openings H where it escapes into the chamber C and rising is drawn through the pipe D to the motor. The object in making the air pass down and up through the gasoline is to insure a doubly rich mixture for starting and low speed work. The needle F is adjustable and any adjustment can be secured by the lock nut M. The capacity of the pipe D is regulated by the adjusting plug K, which can be set to any adjustment and locked by the part N.

After the motor is started practically all of the gasoline is out of the gauge glass C. The holes H are below the level of gasoline in the float chamber. The flow of gasoline is at all times under the constant head of the gasoline and float chamber and it is claimed there is always the same supply of gasoline from the supplementary carbureter at the same speeds. This combination is intended to give a rich mixture at starting and low speeds and a weak mixture at high speeds. The designer has aimed to have the flow of gasoline independent of the air velocity. In this carbureter the float chamber has not to be airtight.

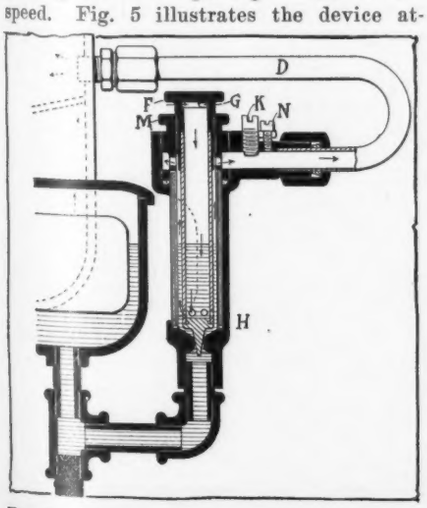
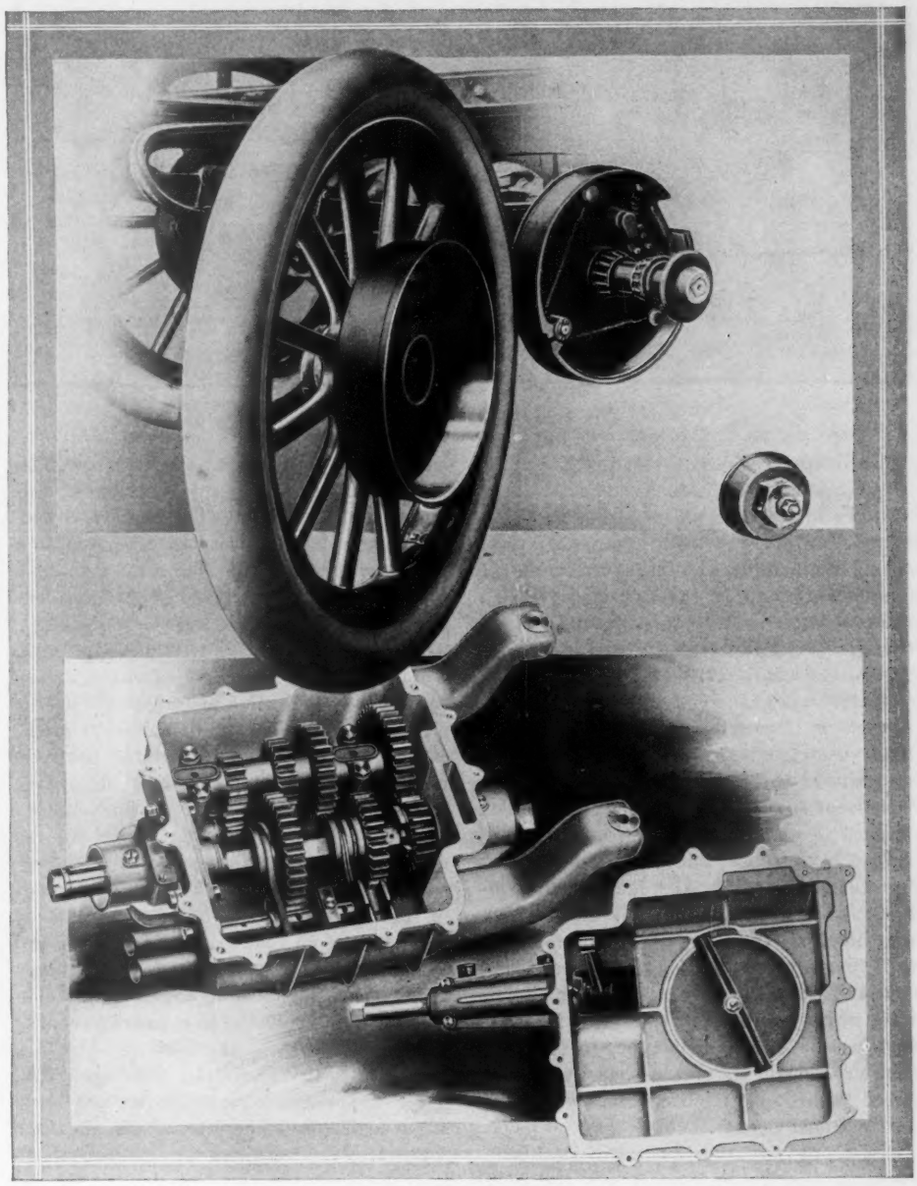


FIG. 6—WEILAND SUPPLEMENTARY CARBURETER

The 1910 Pope-Hartford



FIGS. 3 AND 4—POPE-HARTFORD BRAKES AND GEARSET

FIG. 1—1910 ROYAL TOURIST CAR

Royal Tourist

THE Royal Tourist Motor Car Co., Cleveland, O., has not made many changes in its Royal Tourist car for next season. From the body point of view considerable alteration has been made at the forward end of the car, all of which make it look considerably lighter. These changes are designated by arrows, Fig. 1. Instead of the heavily-curved metal dash a plain, straight wood one is used; the bonnet is somewhat longer because of this. The front fenders are conventional instead of being heavily rounded and ponderous as was the case the present season.

In the motor considerable simplification has been affected in the ignition and lubrication sceneme. The self-starter which was fitted on the first models brought out this year already has long since been discontinued and is not used in connection with next year's models. The ignition system is a Bosch dual type. The adoption of the Bosch system has vastly reduced the wiring required and makes the motor much cleaner.

No more important change has been made in the Royal Tourist car for 1910 than the redesigning of the lubricating system of the motor, which is now simplified and is in brief a crankcase contained system in which an oil pump in a reservoir beneath the crankcase delivers oil to the three crankshaft bearings, the overflow from which furnishes the splash. This system is illustrated in Fig. 6 in which OP is the oil pump located in the reservoir R beneath the lower half of the crankcase. This pump delivers the oil to a filter where carbon or metal particles are prevented from passing into the motor. From this filter a continuation pipe 6 leads to a three-sight feed on the dash and from which pipes 1, 2 and 3 respectively connect with the main bearings of the crankshaft. The crankshaft is drilled at H so that the oil by centrifugal force is forced through pipes H1 from the bearing to the holes H to the lower connecting rod bearings and also by copper pipes K secured to the connecting rod is elevated to the wristpin bearing. This gives a positive circulation to the three main bearings of the crankshaft, the four connecting-rod bearings on the crankshaft and the four wristpin bearings. The illustration only shows the drilling at H for one connecting rod, although all four are similarly cared for. The overflow from this positive bearing lubrication supplies the splash level at C in the crankcase proper, which is divided by vertical partitions into four compartments so that there is a uniform level for each of the connecting rods to dip into. Overflow pipes P allow excess oil to drain back into the reservoir R, which is also provided with a drain tap D which has a stand pipe giving the same level as the overflow pipes thereby making it possible to have a known oil level in all parts of the crankcase. Additional oil is carried in a 3-gallon tank T on the chassis, which has pipe connections direct with the crankcase, for filling same. This oiling system, in addition to lubricating the parts already mentioned, has an oil lead 4 connecting direct with the fan gear.

The rear axle is an out and out floating construction and, as shown in Fig. 4, Timken rollers T, a double race of them, are used for supporting the road wheels and two races are employed for supporting the pinion shaft P, there being a bearing of this type in rear of the pinion which meshes with the differential. The axle drive shafts S carry six toothed clutches C at their outer ends where they transfer the drive to the wheel hubs, and at their inner ends these shafts have integral keyways for fitting into the differential

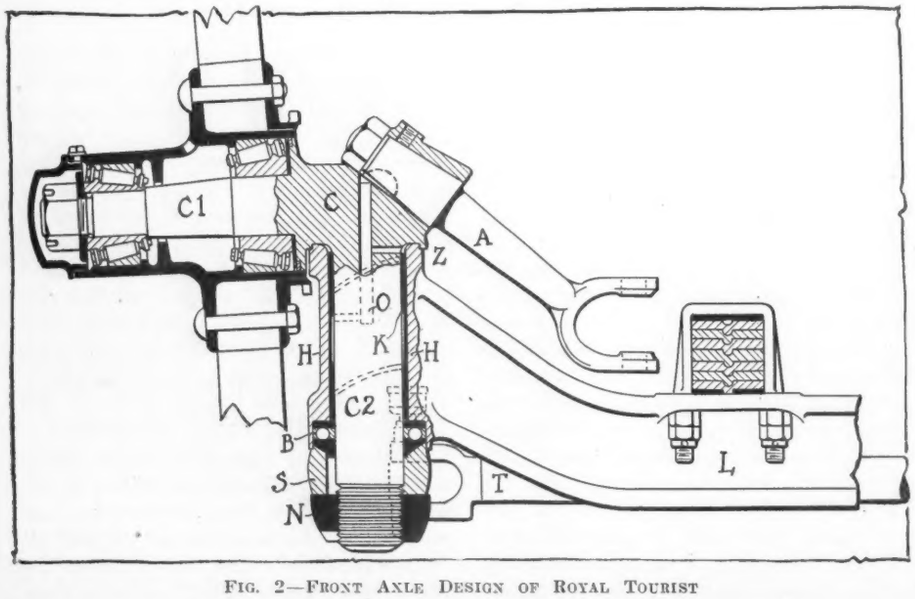


FIG. 2—FRONT AXLE DESIGN OF ROYAL TOURIST

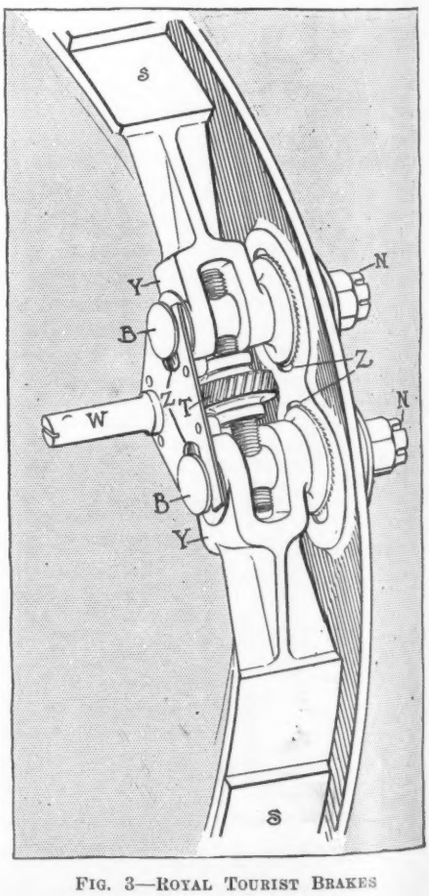


FIG. 3—ROYAL TOURIST BRAKES

1910 Model

bevels. Annular ball bearings are used for supporting the differential framework F and a ball thrust is employed at the bevel side. The axle housing is a four-piece affair, the differential D being divided horizontally in the axle plane, and bolted to each end of it is the axle sleeve X so that brazing does not enter into the makeup of this housing.

The clutch has been improved by the introduction of cork inserts into the cone as well as the adoption of a lighter engagement spring. The lighter spring is used solely because it has been found to give satisfactory results. The transmission is continued practically the same as at present. The entire driving force of the rear axle is transmitted to the frame through heavy radius rods which are pivotally connected to the brake carriers so that the entire driving and braking strain is through these and not through the rear platform springs.

But four brakes are used on the new models, whereas five were fitted on the cars this season. The fifth brake, which was a contracting band acting on the transmission shaft in rear of the gearbox, has been discontinued. The two remaining sets are expanding bronze shoes located side by side and operating in the rear wheel drums. Fig. 4 illustrates the relationship of these, illustrating the respective expanding shoes which are expanded by a cam C, Fig. 5. This cam

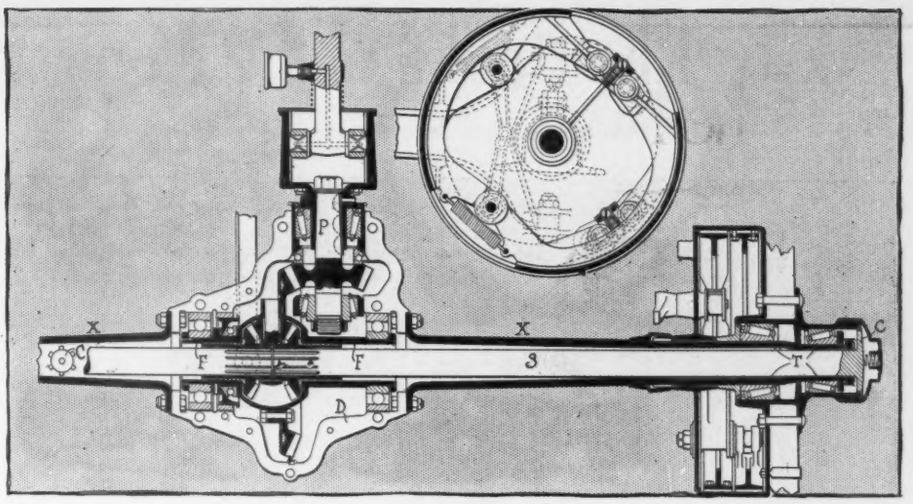


FIG. 4—ROYAL TOURIST REAR AXLE DESIGN

operates between the flattened ends of the bands S. A spring H tends to keep the band S from engaging with the drums or dragging. The method of adjusting each set of brakes is illustrated in Fig. 3, in which only the adjustment of one band is shown, the adjustment of the other being the same. It is a turnbuckle adjustment. The pinion T being on a shaft with right and left threads which enter the bolts B. Attached to these bolts are the yoke ends Y of the brake shoes S. On the end of the shaft W is a worm meshing with the pinion T, so that turning the worm W in one direction forces the bolts B apart, this movement being permitted by the slots Z, through which the bolts B pass. It is necessary before making an adjustment to loosen the nuts N, otherwise the bolts B would not be able to slide.

In the majority of ways the running gear remains unaltered. The side members of the frame are dropped in front of the rear axle in the customary manner and no change has been made in the rear platform spring suspension or in the semi elliptics employed on same. The diameter of the steering wheel has been reduced to 18½ inches, which is 1 inch smaller than heretofore. The front axle on this car is characterized by suspending it beneath the level of the spindle carrying the front wheels, as illustrated in Fig. 2. In this construction the forging C is a right-angled one incorporating the spindle C1 as well as the vertical hub part C2. The axle L ends in a vertical hub H and is carried through the race of ball bearings B. These bearings bear upon the hub part S of the steering arm to which the tie rod T connecting with the steering knuckle on the other end attaches. The whole construction is secured by a heavy knuckle nut N which is prevented from coming off by a taper pin. The forging C has an upward extension for receiving the arm A which connects with the drag link to the radius arm of the steering gear. Arrangements for lubrication of the hub H are made by drilling at O with a radial hole to the bushing K which is pressed into place within the hub part H. A neat precaution which avoids dust getting into this bearing is the cap projection Z at the top of the hub H.

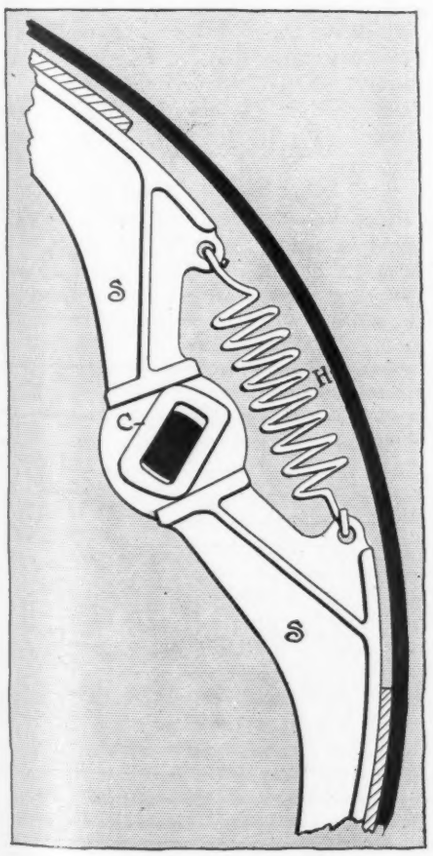


FIG. 5—ROYAL TOURIST BRAKE

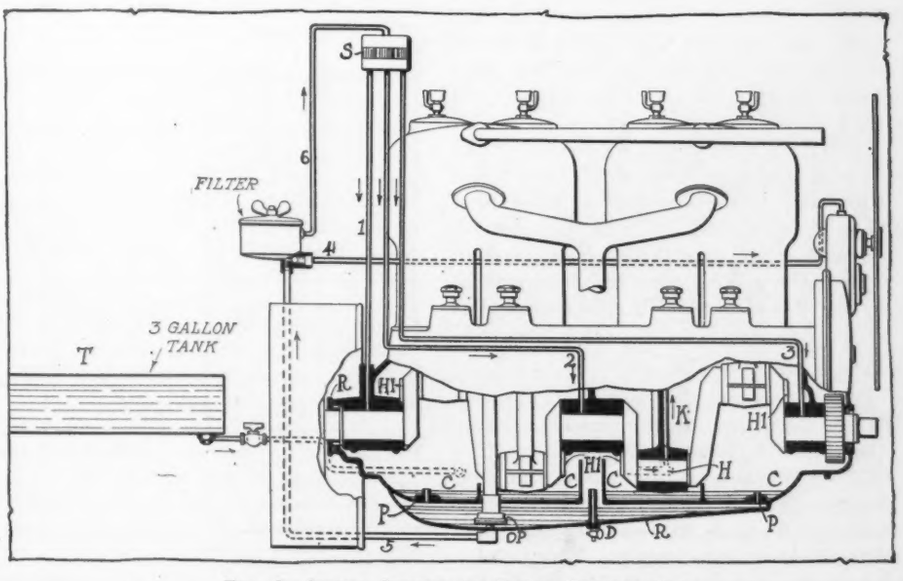


FIG. 6—OILING SYSTEM ON ROYAL TOURIST CAR

The Realm of the Commercial Car

FISK STOCK ROOM FOR TAXICAB TIRES ONLY

Care of Taxicab Tires

KEEPING a taxicab properly shod in the way of tires is a proposition that has caused the tire companies considerable worry and has resulted in a specialization on the part of some that has to a certain extent done away with the annoyance and losses to the taxicab companies occasioned by punctures and blowouts. Most city ordinances call for the delivery of the fare at his destination before the tariff can be collected, and so, in the earlier days of taxicabbing, a blowout generally meant that the passenger had to be thrown on his own resources in the way of transportation, while the driver lost the fare. Now, however, it is getting to be another story. A puncture or a blowout is merely an incident. The driver stops a minute, takes off the damaged tire, slaps on a fresh one fitted to a demountable rim and is away.

To bring about this freedom from tire trouble means a constant watch on the tires, and the different concerns devote considerable attention to this one item. Some buy their tires outright and care for them themselves, while others go into a deal with a tire concern whereby they pay so much a mile for tires, and it is up to the tire maker to see that each of the cabs is kept properly shod. This last scheme has resulted in the establishment of a system whereby a special department is created by the tire maker which does nothing but care for taxicab tires.

Five Concerns in Chicago

Take Chicago, for instance. In the Windy City there are five taxicab concerns that do the bulk of the business. The Walden W. Shaw Co. has fifty-five in service, the Chicago Taxicab Co. has forty-five, the Auto Taxicab Co. has forty-two, Owen Fay fifteen and the Chicago Motor Cab Co. twenty-five, a total of 182 cabs for the five concerns. Each of these companies keeps its machines running 24 hours a day, employing two shifts of drivers. One driver will go on at 8 o'clock in the morning and keep the cab until 8 o'clock in the evening. When he turns it over to his successor it must be in good shape, and therefore the new man looks it over carefully to be sure the other fellow isn't trying to "put one over." In this way the cab is on duty all the time, and statistics show that on an average it will cover 1,800 miles a month. These figures enable one to get an idea of the size and importance of the taxicab business in Chicago alone. With 182 cabs in service and averaging 1,800 miles a month, this makes a total of 3,931,200 miles a year that is covered. To arrive at what Chicago pays for this service, one can take 30 cents a mile as an average, for it must be remembered that the taxicab does not always carry a fare when it is running, it being empty nearly half the time.

Fortune for Cab Service

An official of one of the Chicago concerns who has kept pretty close tab on the machines estimates that a taxicab is running empty 48 per cent of the time. As to its earning capacity, he figures that 30 cents a mile would about cover it. His books show that his highest average for 1 month was 31 11/16 cents per mile, while his lowest was 28 1/5 cents. Using this for a basis for the figuring, and figuring that the 182 cabs travel 3,931,200 miles a year, it is discovered that for taxicab service in 1 year Chicago spends $1,179,360, or an average of $10,148 per cab.

But to get this enormous mileage and to pick up this million and a few odd dollars, it is necessary to wear out a lot of rubber, and here comes in a big item of expense. Roughly speaking, and using Chicago as the basis of the argument, it costs nearly $125,000 to keep Chicago's taxicabs in tires each year. Therefore it is little wonder that the tire companies are on the job all the time. Of the five taxicab concerns mentioned, two—the Walden W. Shaw Co. and the Chicago Taxicab Co.—buy their tires on a mileage basis, using Fisks with demountable rims. The Auto Taxicab Co. buys its Michelins outright on a guarantee of 3,500 miles; Owen Fay uses Empires and Morgan & Wrights, which he purchased, while the Chicago Motor Cab Co. uses Diamonds, which it buys outright.

W. W. Shaw Co. CAB 11

	Date	Hub Odom.	Meter	Meter Mileage	R F	L F	R R	L R	S	REMARKS	Hub Odom. Weekly Mileage	Meter Weekly Mileage
1909.	6/8	7402	230	3649	285	109	224	252	207	Forwarded.		
	6/11	7720	"	3966	"	"	"	"	"			317
	6/11	"	444	3440	"	"	"	"	"			
	6/15	8161	"	3871	"	"	"	"	"		749	481
	6/22	9070	"	4788	270	"	244	"	"		919	917
	6/29	80	"	5768	"	"	"	"	"		980	980
	7/1	81	"	5820	"	"	"	"	"	Order off sprocket		
	7/6	975	"	6670	"	"	207	"	362		894	922
	7/9	1086	"	6800	"	362	"	"	(109)	Wheels out of line		
	7/13	1699	"	7413	"	"	"	198	464		722	728
	7/15	1784	"	7498	"	"	"	464	242			
	7/20	2429	"	8143	"	"	"	"	"		780	730
	7/21	2516	"	8230	"	"	209	"	"			

PAGE FROM LEDGER SHOWING TIRE RECORD OF EACH TAXICAB

The buying by mileage means that the taxicab concern is relieved of all tire work. It is up to the tire company to see that each of the machines is kept in tires and to note each day's mileage, in order to collect its tire bill. Therefore, this means a specialization along these lines, and to give good service the Fisk company has established a department the sole duty of which is to care for taxicab tires. This department has a room by itself on the second floor of the Chicago Fisk branch, and three men are detailed on the job. One of these men goes on duty at 4 o'clock each morning, and in the Fisk company's commercial motor wagon he makes the rounds. At each garage he collects all the tires that have either punctured or had blowouts the day before. These he takes back to the branch and the force is at once put to work repairing the damage, so that during the afternoon it is possible to again make the rounds and deliver a fresh supply of tires.

All of this, of course, makes it easy for the taxicab driver. No longer does he is strapped a spare tire fitted to a demount- is trapped a spare tire fitted to a demountable rim, and tire trouble means a stop for only a minute or so. The damaged tire is taken off and a new one put on. Then when the driver passes the taxicab garage he stops and picks up another spare and is on his way. The tire equipment for each cab consists of six tires. Four of course are on the wheels, another is on the running board and the sixth is kept at the garage for emergencies.

Rough Usage Given Tires

It might be asked, what would the driver do if he has a puncture after he has used his spare and has not picked up the relief? But statistics show that this occurs very rarely. Also the taxicab drivers have few blowouts, most of their troubles being punctures, which are brought about largely because of the rough work the cabs have to do. They run over all kinds of city streets and often up alleys. Of course this subjects the tires to rougher usage than they would get in pleasure car service, and the result in a fine crop of nails. Most of the trouble comes on rainy days, and the luck varies. The Shaw records show that on 1 day there have been twenty-five cases of tire trouble and on another only three. Another surprising thing in this connection is the longevity of inner tubes, which are said to often outlast three casings. In fact, the Fisk records show that in less than 2 years only twelve inner tubes have been junked as being unfit for further service.

The Fisk taxicab service was installed in February, 1908, and since that time it has been so systematized that an accurate history of each tire can be had at any moment. As a tire goes into service it is branded and given a page in the record book. The date on which it is placed on a cab is booked, the wheel on which it is placed is recorded, and on the same page are columns for the odometer readings and the mileage. In this manner it is possible to find out just how the tires are standing up. Another book is devoted to the cab itself, and the page shows columns for the date, hub odometer readings, the taximeter readings, the meter mileage and on which wheel each numbered tire is placed. Another column is used for recording the position of the spare tire, while in the last two columns are the weekly mileage and the total mileage. In this manner the company is able to make out its bill to the taxicab concerns. Each day a representative of the Fisk looks up the mileage of each cab. On each machine it has a hub odometer which is checked up with the taximeter. Usually there is little difference between the two.

In Taxicab Tire Department—Daily Care Given Tires

Disposition of Old Rubber

Another item of interest in connection with this industry is the disposition of the old tires which have been used until they are absolutely unfit for further service. Like most anything else, there still is a market for them, but not a very profitable one. In the case of the Fisk, all these old tires are sent back to the factory, where the experts take them in hand and make a critical examination of them in order to see just what the troubles are, and to use this information in improving the product. This done, the old tires are considered junk. A workman is given the job of cutting out the beads, and then the old rubber is sold to a reclaiming company, which uses the product for the manufacture of mechanical rubber goods. This old rubber brings about 9 cents a pound—not much when you consider that crude rubber now is selling at $2.07 a pound. The beads that are cut off are of little use, because they are hard rubber, but still there is a market for them, although only a few cents a pound is realized.

M. C. Shaw Co. TIRE 109

TYPE Bolted STYLE Pl 1st SIZE 4X32 SERIAL No. C 79116

Date	Where	Position	Odom.	Mileage	REMARKS
1909. 3/9	Cab 14	L.R.	763		
3/1	For record		1460	697	3/1 697 Miles
4/1	" "		4212	2752	4/1 3449 "
4/1	Meter change		4932	720	
4/8	New Meter		271		
5/1	For record		2540	2269	5/1 6488 Miles
5/19	Off		3875	1335	Puncture
5/22	Cab 11	L.R.			
5/25	" 11	L.R.	2747		
6/1	For record		3187	440	6/1 8213 Miles
6/11	Meter change		2966	779	
6/11	New Meter		7220		
7/1	For record		81	2861	7/1 11853 Miles Scrapped @ 12229
7/1	New Meter		5820		7/9 12933 Miles.
7/9	Off		6800	980	

Page from Ledger Showing History of a Taxicab Tire

CRANKSHAFT CONSTRUCTION AND DESIGN

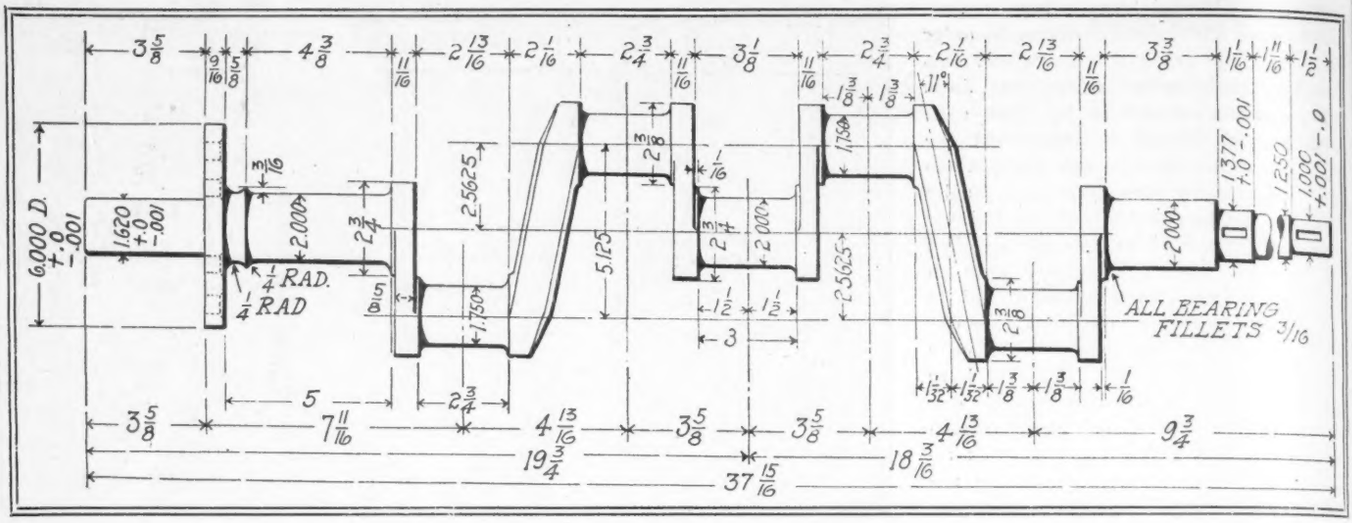


FIG. 37—MORA FOUR-CYLINDER CRANKSHAFT SHOWING ALL PROPORTIONS AND CENTERS

PLAIN bearings when used do not alter the facts of general design of crankshafts, for the reason that the static and kinetic moments are not different in the respective types, and the lengths of bearings should not be taken into account in determining the lengths of beams in establishing the bending moments, only in so far as it may be true that long bearings may make the distances from center to center greater, so that it is possible to have conditions when plain bearings are used which do not enter into the problem when ball bearings are substituted.

The centers of the bearing then are the point of support, no matter what kind of bearings are used, and the unsupported lengths will be the distances between the centers of adjacent bearings. Taking Fig. 37 as an illustration, the unsupported distances between main bearings must be computed between the center lines of main bearings, irrespective of the length of the bearings. For the beam length between the main bearing at the flywheel end and the center bearing, this distance will be found to equal 12¾ inches, and by suitably summing up, using the dimensions

By Thomas J. Fay

(Continued from page 35 last week.)

given, the remaining beam length may be established. This crankshaft, which is a Mora, used in the light four for 1910, is of the four-cylinder type, with a bore of 4½ inches and a stroke of 5⅛ inches. The diagonal arms are of relatively great area, which is right for the design, and the short arms, at right angles to the axis, are relatively thin, but in harmony with the requirements. The 1/16-inch fillets at all points are adequate assurance of good work from the point of view of eliminating ill-effects of abrupt turns, and as the requirements would seem to indicate, the main bearing next to the flywheel is increased in length enough to take care of the extra work imposed.

Flywheel Flanged On Shaft

Although it may not be absolutely necessary to flange for the flywheel, it is nevertheless good practice and it assures that the flywheel will not go adrift. In earlier times when the problem was not so well understood it was not uncommon to hear of loose flywheels and in every single instance a considerable repair bill was indicated, excepting when flanging was resorted to, in which class of work all that is necessary is to tighten up the flange bolts and lock them on by means of cotter pins, using castellated nuts in the process. The pressure as shearing moments on the flange bolts at a radius of 3 inches from the axis of rotation, is far less than the shearing moment imposed on a key at a radius of less than 1 inch, which is about the usual relation. The ability of six bolts is greater than that of one key, and it cannot be shown mathematically that more than one key will serve a good end.

Pressed and Tapered Fit

When flanging is not resorted to, the next best plan is to press the flywheel upon a taper of about 1/16 inch to the foot, which taper has the advantage of accuracy in the machining process, since the machinist will know that for each .001 inch reduction in radial diameter, the flywheel will press on for a distance of 1/16 inch. Parallel fits can be made, but it is extremely difficult to do so, and that they will hold nearly so well is scarcely to be expected. In a press fit

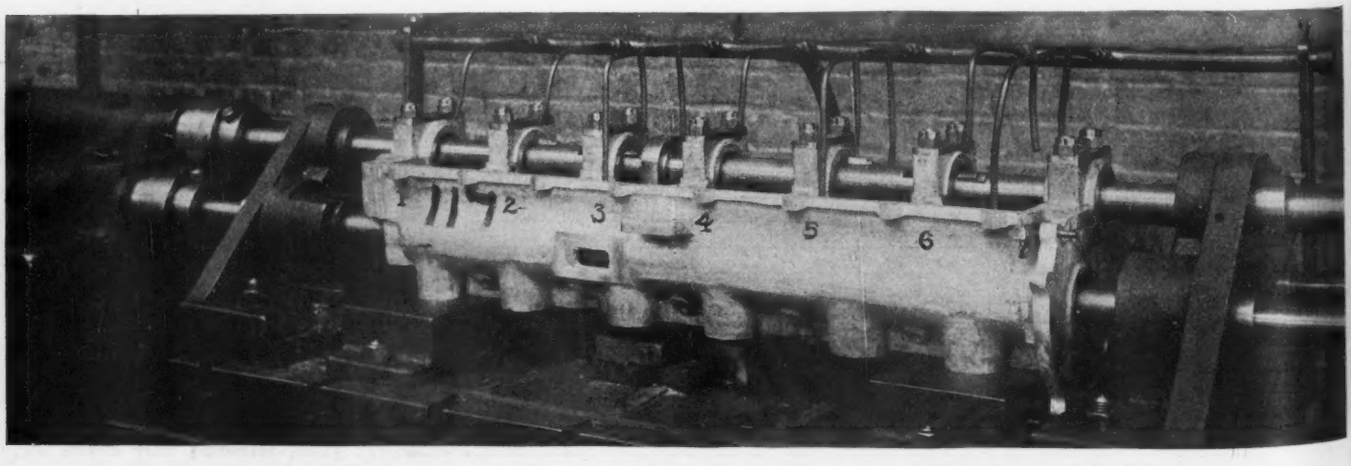
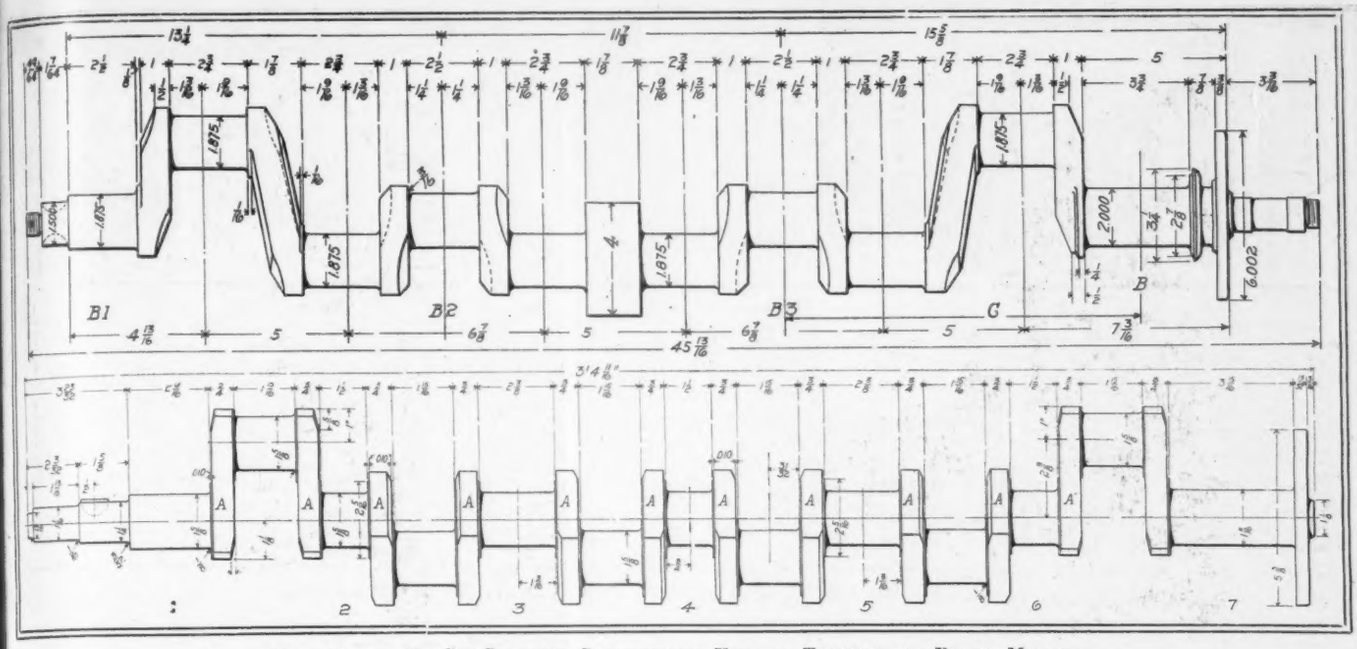


FIG. 41—METHOD OF BORING PIERCE SIX-CYLINDER CRANKCASE TO ASSURE BEARING ALIGNMENT



FIGS. 38 AND 39—SIX-CYLINDER CRANKSHAFTS USED IN THOMAS AND PIERCE MOTORS

if the diameter of the shaft is about 2 inches the maximum pressure may be as much as 60 tons, and no flywheel should be retained in place if the pressure falls below 15 tons.

When it becomes necessary to make a repair, it is quite evident that flanging offers advantages, for if the flywheel is to be removed it is much easier to unbolt at the flanging than it is to draw the same off after it has been properly pressed on. In a repair shop properly fitted out it is possible to do the work either way, so that both methods are available for use and under certain conditions it is impossible to retain the flange, hence a press fit is used.

Practice in Six-Cylinder Work

Between four and six-cylinder crankshafts there are differences to be noted which are quite beyond a purely mathematical basis, considering the usual methods pursued. In a four the impulses are separated by a period of time and the metal has an opportunity to recover between twisting moments. In a six this is not so; just when the crankshaft is under stress, a second twisting moment is applied due to the overlapping torque characteristic and the easiest way to deform a member is to first put it under stress and then strike it a sharp blow.

In the model M six-cylinder motor, as used in the 1910 cars made by the Thomas company, this phase of the problem is being dealt with in such a way as to serve as an illustration of the requirements. The shaft, Fig. 38, is given with all essential dimensions, and as will be observed it is not of a clumsy section considering the bore and stroke of the motor, which are 4¼ by 5½ inches respectively. Only the last bearing B next to the flywheel is 2 inches in diameter, and the remaining main bearings, B1, B2 and B3, are 1⅞ inches in diameter, but of such a length that the bearing surface afforded is quite up to the requirements. With the last bearing big enough to support the accumulated torque, advantage is taken of the lower surface and speed attending the remaining bearings and the lubricating problem is reduced to a minimum.

In view of the undoubted advantages of a long stroke; considering the requirements in a six, the problem is adequately coped with by the use of suitable selections of material, in which kinetic life is accentuated, first by virtue of the composition and then by proper heat-treating methods.

Chemical Composition Thomas Crankshaft

Carbon	from .24 to .30
Nickel	from 3.25 to 3.75
Sulphur	from lower to .025
Phosphorus	from lower to .025
Manganese	from .60 to 1.00
Copper	from lower to .025

This shaft is drop-forged to shape. Care is exercised to have the heat of forging in full accord with the requirements. The steel is given a toughening treatment by being heated to 1,500 degrees Fahrenheit; quenched in oil, and temper drawn at 500 degrees Fahrenheit. As an average of the physical properties of the steel, the following will hold:

Tensile strength, 110,000
Elastic limit, 60,000
Elongation per cent in 2 inches, 20
Reduction of area in per cent, 69

In actual practice the chemical composition prevails within far closer limits than

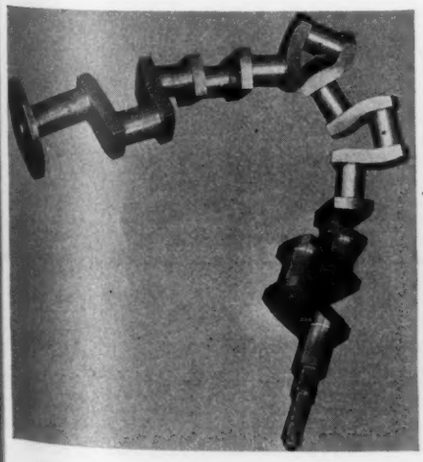


FIG. 40—PIERCE CRANKSHAFT TESTED

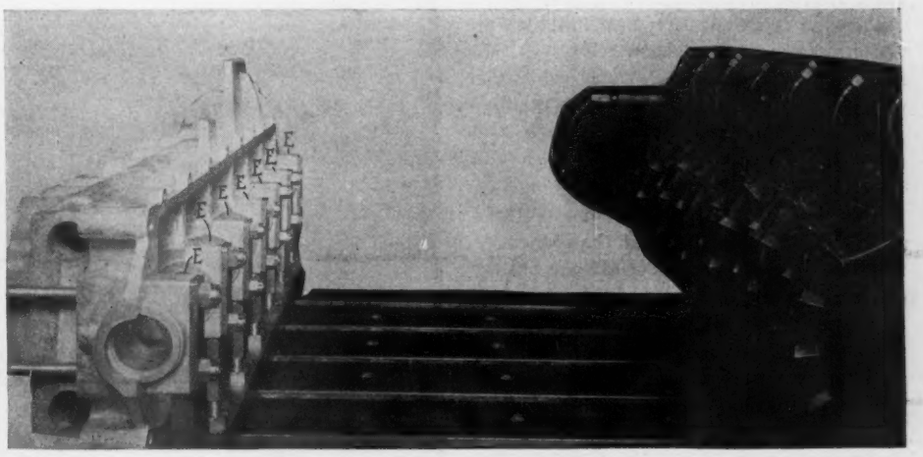


FIG. 42—BANK OF MILLERS TO FACE ENDS OF BEARINGS

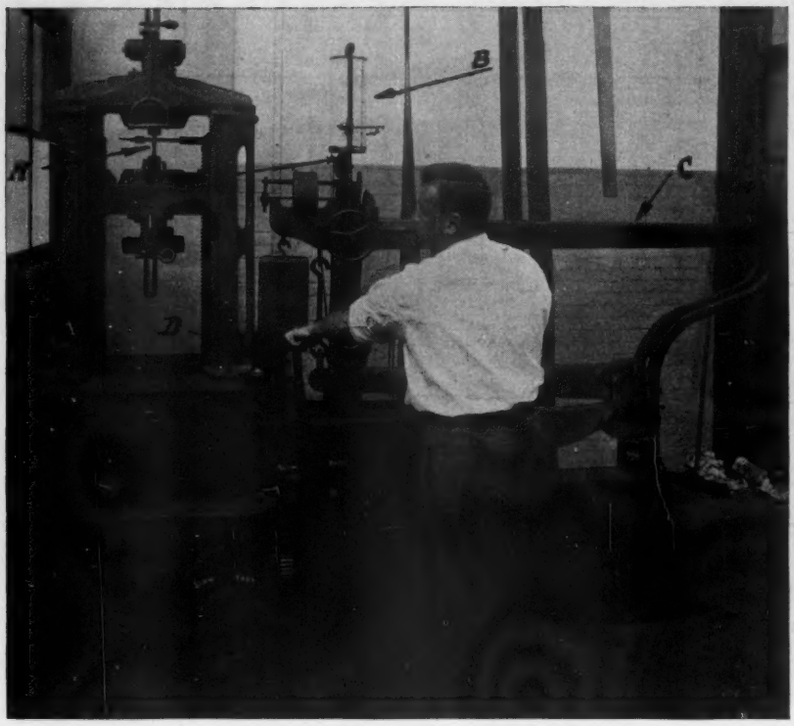


FIG. 45—TESTING MATERIAL IN PIERCE LABORATORY

FIG. 43—PIERCE CHEMICAL LABORATORY

the above range, but it is claimed that, within these limits, considering the low limits of sulphur and phosphorus, the results will be thoroughly good. It is believed that the precise methods used in heat-treating have much to do with the fine results in practice, and that good cannot follow to the same extent, no matter what may be the chemical composition, unless the heat treatment is properly done.

In the Thomas crankshaft, as described, there is a bearing on each side of each pair of cylinders and the order of firing is 1-4-2-6-3-5. The distance from center to center of the first and second main bearing counting from the flywheel end C is 13⅛ inches.

The Pierce Crankshaft

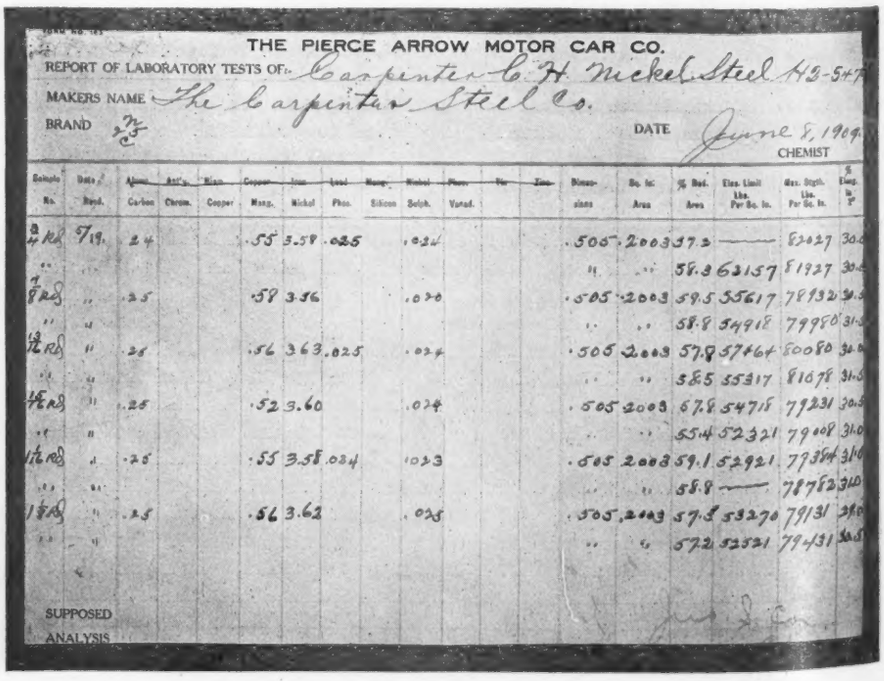
As an example of another design of a six-cylinder crankshaft Fig. 39 is offered, in which the material is alloy steel and a bearing is placed on each side of each cylinder, thus introducing seven main bearings, 1, 2, 3, 4, 5, 6 and 7. The effect on the design is at once apparent, in that all the crankarms A are short, relatively thin and of the same area from one end to the other of the crankshaft. This plan requires good aligning, well-fitted bearings and methods in the shop that will result in uniformity.

Fig. 40 is a reproduction of one of these shafts as it was bent cold at the request of the writer in order to ascertain the ability of the metal to withstand ill-usage. It required an enormous effort to bend it to the shape shown, and no amount of ingenuity on the part of the men doing the work would produce any further result unless at great risk. As the illustration shows there was no sign of fracture, the general appearance of the metal as the result of a close inspection was thoroughly good and David Ferguson, chief engineer of the Pierce company, is authority for the statement that not one crankshaft of this material and design ever gave out in service. In this case, as well as in the preceding example, heat treatment is relied upon to induce kinetic qualities, rather than to rely upon the use of normal steel.

Accuracy in Process Imperative

Increasing the number of main bearings augments the chances for trouble excepting in the hands of expert operators, provided with suitably contrived special tools. In the plant of the Pierce company this phase of the problem is disposed of in the manner as shown in Fig. 41, which represents a substantial boring tool in which the bars float so that the respective bearings, 1, 2, 3, 4, 5, 6 and 7, line up with great perfection. The boring alone is not enough, however accurate the work may be, and Fig. 42 shows a gang of facing mills F at work on a crankcase, facing off the ends E of the bearing supports, the accuracy of which is so great as to assure that the end shake will be properly divided up among the respective bearings.

In the heat treatment of the material, it is again a question of facilities as well



THE PIERCE ARROW MOTOR CAR CO.

REPORT OF LABORATORY TESTS OF: Carpenter C. H. Nickel Steel H2-5+7

MAKERS NAME: The Carpenter Steel Co.

BRAND: H/C

DATE: June 8, 1909.

CHEMIST

Sample No.	Date Rec'd.	Alum. Carbon	Alum. Ass'n. Chrom.	Alum. Alum. Copper	Copper Manganese	Iron Nickel	Lead Phosphorus	Manganese Silicon	Nickel Sulphur	Phosphorus Vanadium	Tungsten	Zinc	Dimensions	Sq. Inches Area	% Red. Area	Elastic Limit Lbs. Per Sq. In.	Max. Strength Lbs. Per Sq. In.	% Elong. in 2"
3/4 Rd	5/19.	.24			.55	3.58	.025		.024				.505	.2003	37.2	——	82027	30.0
"													"	"	58.3	63157	81927	30.0
7/8 Rd	"	.25			.58	3.56			.020				.505	.2003	59.5	55617	78932	31.5
"	"												"	"	58.8	54918	79980	31.5
1/2 Rd	"	.25			.56	3.63	.025		.024				.505	.2003	57.8	57464	80080	32.0
"	"												"	"	58.5	55317	81078	31.5
1/4 Rd	"	.25			.52	3.60			.024				.505	.2003	67.8	54715	79231	30.5
"	"												"	"	55.4	52321	79408	31.0
1/4 Rd	"	.25			.55	3.58	.024		.023				.505	.2003	59.1	52921	79354	31.0
"	"												"	"	58.8	——	78782	31.0
1/8 Rd	"	.25			.56	3.62			.025				.505	.2003	57.5	53270	79131	31.5
"	"												"	"	57.2	52521	79431	30.5

SUPPOSED ANALYSIS

FIG. 44—A RECORD TAKEN OF ONE PIERCE LABORATORY TEST

as skill. In view of the great importance of doing the work at exact temperatures, it was found necessary to use pyrometers in which the temperature is held close to limits from 8:30 a. m. to closing time—5 p. m.—at about 1,700 degrees Fahrenheit. The range of the recording instrument is sufficient to serve as a guide under all conditions as when annealing, heating to quench, or for tempering.

Composition Determined For Every Heat

This question of accuracy must be carried almost to extremes if the results are to be of an exacting character. Heat treatment will do more harm than good unless the exact character of the material is known, and in the plants which make a practice of heat treating to accentuate kinetic qualities of the material used, the chemical composition of the material is determined to a certainty by modern laboratory methods. To show the way in which this part of the work is conducted, Fig. 43 of the Pierce chemical laboratory will serve as an illustration. Since chemical composition alone is no guarantee of quality of material, physical examinations must be made and Fig. 44 depicts a record taken from the testing machine in the same plant, presented here with the idea of pointing out how the personal equation is reduced to a minimum by the use of recording devices rather than to depend upon the keenness of the expert; these methods do not prevent the exercise of acumen.

Just how the record, Fig. 44, was taken is adequately portrayed in Fig. 45, in which A is the test proof being pulled, B is the record, C is the beam of the scales, D is the speed and control lever. Fig. 46 is a reproduction of some tests, taken from the files at random, merely to indicate the manner and completeness of the methods used and required in a shop which leaves nothing to chance.

Methods of Crankshaft Design

Theoretical methods of designing such important parts as crankshafts frequently fail of their purpose for reasons as follows: It is extremely difficult to ascertain all the influencing factors; the material may not be up to the standard assumed for it; road operation introduces many variables which are difficult to realize; fuel and ignition problems make the whole problem speculative; skill in operating a car is not on a common basis, in other words the personal equation is difficult to reduce to exact figures. Under the circumstances a system of approximations influenced by precedent may be of greater practical value than more conventional designing methods, which does not prevent attempts at purely theoretical work.

(To be continued.)

ONE-CYLINDER IN FRANCE

The high price of gasoline, together with special methods of taxation and, in a smaller degree, the state of the highways, have all tended to the development and popularity of the one-cylinder type of car in France. Conditions are so different in America that doubtless the monocylinder never will attain the same importance as in France. It nevertheless is interesting to note what has been done by specialists on the other side of the water.

The first rule that was laid down was that the single-cylinder car must look like a four. This was not difficult to arrive at, and has been so generally copied that from an examination of the lines only it would be impossible to say whether the bonnet housed a one, two, or four-cylinder engine. Frequently to aid in the deception without losing too much space the gasoline and lubricating oil tanks are fitted on the dash. The next point was to make the engine so silent and easy-running that it would be impossible for the ordinary man to declare how many cylinders were at work. This was a more difficult problem, as was shown by the fact that many a car from a good factory looked all right when it was motionless, but revealed its number of lungs as soon as the starting crank was pulled over. Such improvement has been made during the past year or so that there are now two or three makes of cars with only one cylinder that can be throttled down so low and made to turn so quietly that only an expert placed 6 feet away could certify to the number of cylinders. It is understood, of course, that the type of engine can be detected if it is raced, but it is a fact that if throttled down to run at the slowest speed, such engines as the latest models of the Sizaire-Naudin, de Dion and others that might be mentioned are not only so quiet that they cannot be heard a few feet away, but would put to shame some fours which would object to being called bad.

Taking the Sizaire-Naudin as one of the best examples in the one-cylinder class, one finds a vertical cylinder of 4.7 by 5.1 inches bore and stroke, with superimposed valves, the exhaust being operated from below and the intake from overhead. In accordance with modern practice, the valves have a large area even on the standard models, while on the semi-racing and full-racing models it reaches the abnormal. There is nothing of special interest about the exhaust, but the operation of the intake, which is immediately above it, is of greater interest. The lift of the valve is varied by the displacement of a helicoidal cam, operated from the lever on the steering wheel. There is no control direct on the carbureter, the amount of lift of the valve, of course, regulating the amount of mixture that can be aspired. The rocker arm is a short lever with two spherical ends, one of which fits onto the projecting stem of the inlet valve, while the other receives the end of the vertical push rod. It pivots on a crossbearing above its center, against which it is pushed by both the valve stem and the push rod. A wrench allows the entire valve-operating mechanism to be dismounted in a few seconds.

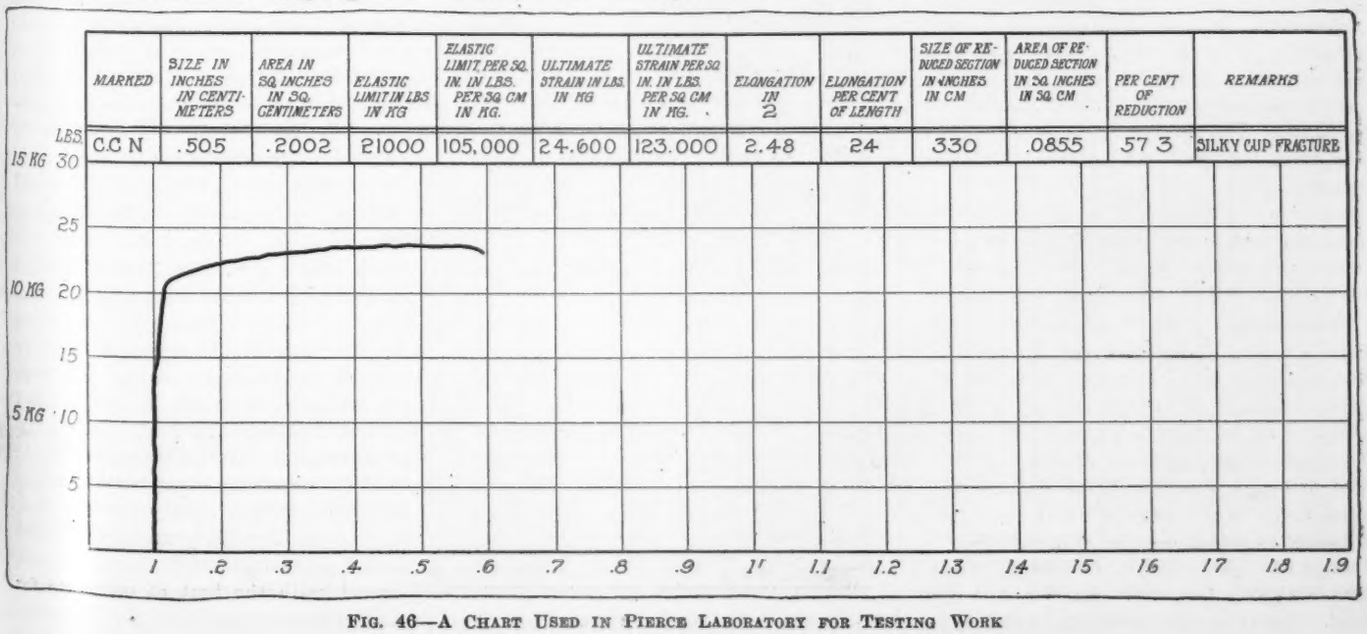
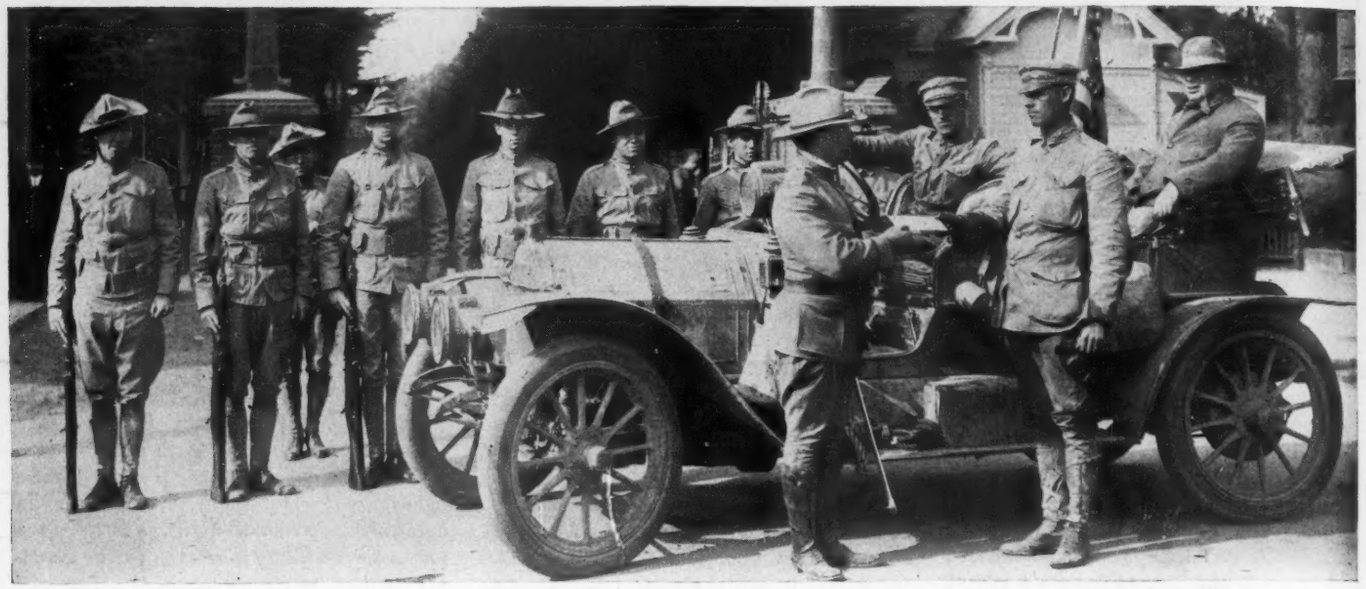


FIG. 46—A CHART USED IN PIERCE LABORATORY FOR TESTING WORK

From the Four Winds

N S E W



DELIVERING MESSAGE AT PRESIDIO, SAN FRANCISCO, BROUGHT FROM NEW YORK BY MITCHELL RANGER

Ohio Wants Guideposts—The latest proposed legislative action in Ohio in the interest of motorists is the move made to present a bill providing guideposts at all cross roads in the state.

Assessors Get Busy—Outagamie county, Wis., assessors discovered fifty-seven motor cars in that territory, the city of Appleton admitting thirty-four. For the first time in many years, not a single bicycle is on the rolls.

Racing at Sedalia—Two racing days for motor cars have been set aside for the Missouri state fair at Sedalia, Mo., October 8 and 9—and there will be six events. The first is a 25-mile endurance race for the state fair trophy of $500. The entry fee is $20.

Denver's Motor Receipts—The city treasurer of Denver reports that the motor car driver's licenses for the 8 months ending August 31, 1909, amounted to $3,196. The amount for the corresponding term last year was $1,610. The car licenses issued up to August 31, 1909, amounted to $797.50, and for the same period in 1908 the amount was $977.50. There are now over 4,000 cars registered at the city hall.

Waiting for Decision—Minneapolis motorists are still awaiting the decision of the technical committee in the matter of the awards of the Dispatch and Johnson trophies in the recent Little Glidden trip from the Twin Cities to Fargo, held the last week in August, and many believe that Minneapolis motorists will have the pleasure of seeing all four trophies offered in this event captured by Minneapolis cars and drivers. The final hearing will be held October 5, and according to new evidence secured which affects the economy standing of the St. Paul Chalmers-Detroit, it looks as if H. J. Clark's Packard would be declared the winner.

Barring Outsiders—In order to bar outside passenger wagons and motor cars during fair week the city council of Fremont, O., has passed an ordinance placing a tax on all vehicles, ranging from $3 a year to $30 for large passenger cars. The money derived from the licenses will be used in sprinkling the streets leading to the fair grounds.

Reading Square Deal Town—Reading, Mass., has joined the ranks of the square deal towns in the Bay state. Under the direction of Chief of Police Leggett, who formerly was connected with the Boston police force, signs have been hung across road that is used by motorists going through the town, and it says to them: "Motorists, Notice! Please Observe the State Speed Laws Through This Town.—Reading Citizens' Association." Chief Leggett is going to give the signs a thorough trial and if they are disregarded he will resort to setting traps.

Last Day at Seattle—A small but appreciative crowd witnessed the events of the closing day of racing at Seattle. An excellent program was pulled off in which there were many spectacular events. The chief event of the afternoon was the 5-mile race between the White steamer and the Allen-Kingston, both of which cars were in the 24-hour contest. This was won by the White. A race for the amateur championship of the northwest was won by Marc Bunnell in an American. M. Robert Guggenheim, promoter of the carnival, is very much pleased with the result of the 3-day meet and states that he will shortly incorporate the Seattle Automobile Carnival Association and hold a similar event every year.

Milwaukee Abandons Meet—Unforeseen obstacles prevented the Milwaukee Automobile Club from holding its fourth annual racing carnival at State Fair park, Milwaukee, on September 24 and 25.

Outdoor Show in Utah—Rupert Fritz, general manager of the Utah show announces that the first one to be held in the state will be at the Salt Lake fair grounds November 3 to 13. Since early last spring work has been progressing in the line of arrangements with the result that everything is in readiness.

Boston's Show Dates—Manager Chester I. Campbell, of the Boston show, is planning to visit the exhibition at Atlanta in November in search of ideas for the next Boston show. The directors of the Boston Automobile Dealers' Association intend to stick to the same date for its show as in the past, the second week in March, and it will be held in Mechanics' building, as usual.

Wants Money to Fix Road—The run from Portland, Ore., to Government Camp, well upon the snowy sides of Mount Hood, is one attempted by all true lovers of the motor car and made by many. The present condition of the roads is very bad and President E. Henry Wemme, of the Portland Automobile Club, has taken up the matter of improving them with Multnomah and Clackamas county officials, business men of Portland, members of the club and property owners along the route of travel, with the best of prospects for raising sufficient funds for the macadam-

izing and oiling of the route in the coming year. The sum necessary to be raised to complete the project is $20,000, and President Wemme is confident of success.

Stopping a Nuisance—At the request of the Automobile Club of St. Louis, Chief of Police Creecy has issued an order to all his captains requesting them to see that the ordinance prohibiting the throwing upon the streets of nails, glass and other things which injure tires be rigidly enforced. For months motorists have complained that the streets of this city have been kept in such shape, especially in the downtown districts, that their tires are punctured almost daily.

Burying the Hatchet—An informal luncheon club may be the means of healing a long-standing lack of co-operation between the dealers of San Francisco. At a meeting of a dozen representative dealers of the city at the St. James Hotel, it was decided to have luncheon together once a week. There will be no formal organization as yet, if ever, and there will be nothing but friendly discussion of matters of mutual interest when the weekly gathering about the luncheon table is held.

Need Better Streets—The street board of the city of Hartford, Conn., is $6,000 shy and that extensive repairs to streets necessary is due to motor cars is the plea of the board. The board estimates an increase of 100 per cent in the motor car traffic of the city and this accounts for the excessive wear the streets heretofore have not experienced, so it is claimed. However, the motorists of the town are rather disgusted with the condition of the streets, which have not been bettered all season.

Ohio's Latest Report—Ohio's report for the month ending September 15 indicates an increase in the number of motor cars registered and also that renewals are up to the usual number. The report shows owners registering new cars to number 603 which brought in a revenue of $5,277. Manufacturers and dealers registered to the number of twenty producing fees of $200 while chauffeurs to the number of 225 registered at a cost of $450. Renewals on cars numbered 618, while manufacturers and dealers to the number of three filed renewals. The total revenue of the department for the month was $8,192.

Big Parade for St. Louis—To add to the large number of motorists expected to visit St. Louis by car during the centennial week celebration, October 4 to 9, the Moon Motor Car Co. is making arrangements for a round-up of several hundred Moon owners from outside of St. Louis. The company will take pains to entertain all Moon motorists who come from out-of-town and will make special arrangements for those who drive a distance of 250 miles or more to St. Louis. Suitable souvenirs will be given to all Moon tourists and trophies will be awarded to those making the longest runs. A monster motor parade will take place October 9, the final day of the aerial tournament. More than 700 entries of cars, one-third of which will be decorated, already have been received by the committee in charge of the event.

Will Vote On Bonds—On October 12 the township of Ravenna, Muskegon county, Mich., will vote upon a proposition to bond for $35,000 for the purpose of improving the roads in that vicinity.

Motorphobe Discovered—A case of rabid fanaticism is reported to the Wisconsin State A. A. from Columbus, Wis. While a mixed party was proceeding to Beaver Dam a farmer ran out from his barn with a pitchfork and jabbed it viciously at the motorists, meanwhile swearing lustily and crying that he would punish all motorists because they were a nuisance and deserved no consideration. An investigation is being made.

Ohio's Strength—Ohio State Registrar Fred C. Caley, of the motor bureau, has figured out that there are 21,458 cars owned in the state and that 9,610 are owned in the nine most populated counties. Cuyahoga county has 5,123 machines, making Cleveland stand in the lead somewhat, while Hamilton county has 1,177, Franklin county 1,181, Lucas county 785, Summit county 718 and Montgomery county 625. Half of the owners live outside of the large cities of the state.

Big Entry Expected—It is expected that at least fifty cars will participate in the amateur sociability contest from Indianapolis to Mudlavia Springs and return next Saturday and Sunday. The Warner Instrument Co. has donated a $100 silver trophy cup to be awarded to the winner of the contest, and R. B. Kramer, of Attica, has offered a similar prize. There also will be a prize for the winner of a hill-climbing contest to be held at the conclusion of the first day's run. The contest will be run on a secret schedule, the driver coming closest to the schedule winning the prize for cars in his class. It is designed to make the event an annual one, as evidenced by the fact that the holder of the Warner cup must defend it 3 years in succession in order to hold it.

Sixty Miles of Good Roads—Sixty miles of good roads have been built in Michigan since July 1. There are applications in for sixty-seven additional miles to be built under the state reward good roads law. Forty-six counties are interested in the roads being built.

Big Sign Boards Must Go—The large and unsightly sign boards that have been a source of considerable unfavorable comment by those motoring through the Cincinnati parks will be replaced by guide boards of much neater pattern. They will bear a more welcome notice inasmuch as they will read that a 15-mile limit will be allowed through the parks instead of 7 as in the past. A fine of $25 is posted for a violation of the speed limit.

Blue Book Tourists—E. R. Mixer and Henry McNair are now touring through New England in a Knox runabout preparing new statistics relative to roads, garages, hotels, etc., for the Official Blue-book. Last week they were going through New Hampshire covering the lake region. They have been pretty well over the state, but there were some additional routes that had not been printed in former editions which will be mapped in the 1910 book.

One-Day Meet for Milwaukee—A 1-day race meet, with a 100-mile stock chassis event as a feature, has been arranged by the Milwaukee Automobile Club for Saturday, October 2, in place of the 2-day meet which was to have been held on September 24 and 25. The 24-hour event, however, will not be held. State Fair park, near Milwaukee, will be used. The state militia will police the course. Trophies will be awarded to the winners.

ARRIVAL OF MITCHELL RANGER WITH WAR-MESSAGE IN SAN FRANCISCO

Cincinnati Club Growing—Twenty-five new members have been added to the roster of the Automobile Club of Cincinnati in the past 30 days.

Buffalo Fall Field Meet—The annual fall field meet of the Automobile Club of Buffalo will be held at Williamsville, N. Y., on October 2, the gathering to include the twofold aspect of a clambake and gymkhana. The gymkhana events will be held after the clamfest. About seven or eight events will be on the program.

Glad Hand for Tourists—Owners at Eau Claire, Wis., are taking steps to organize a club, to be affiliated with the Wisconsin State A. A. and the A. A. A. One of the main objects, as stated in the tentative draft of the proposed constitution, is to extend a welcome hand to the numerous tourists who are daily passing through Eau Claire. A meeting will be held this week for final action.

Trouble Getting Show Dates—The Denver Motor Club is endeavoring to fix upon a suitable date for the show next spring, but owing to the fact that the Auditorium has been leased for theatrical purposes for 20 weeks beginning November 1, the first available date is the week beginning Monday, March 21. As the building also is rented for March 24, there are only 3 days available at that time. This makes that date impracticable. It is possible a date may be arranged for some time in April.

Club Will Improve Road—The Kenton Automobile Club, of Kenton, O., has made a unique proposition to the county commissioners of Hardin county. The club, which is composed of fifty prominent business men, asks permission to select a stretch of road in the county to be improved in a model manner under the direction of the club and also at the expense of the organization. It is specified that the 4 miles of pike will have guide boards at each road crossing. The club has sent to Cincinnati, Columbus and Toledo, O., for copies of traffic ordinances.

Helping State Association—The Cincinnati Automobile Club is promoting the interests of the Ohio State Automobile Association in every way possible. The first move in this direction resulted in the naming of Dr. A. B. Heyl as secretary of the state association. Dr. Heyl is a member of the board of governors of the Cincinnati Automobile Club. Dr. Heyl will visit some town or city in the state each week, either to form a new club or aid some club already organized to add to its membership. Dr. Heyl will make his office at the Cincinnati Automobile Club and has entered into his new duties with much earnestness. The Cincinnati Automobile Club now numbers more than 600 members and much progress is promised in the near future in behalf of the motor car owners of the city and state in support of the Ohio State Automobile Association.

Start a Club at Fairfield—The Fairfield Motor Club has been organized at Fairfield, Iowa, with Dr. W. H. Conner as president. The new organization has about twenty-five members and will affiliate with the state and national organizations.

Finishing Long Tour—Ira Morris, a Boston clubman, accompanied by his wife and a chauffeur, passed through Chicago Wednesday on his way back from a tour from Boston to Seattle. He is driving a Pope-Hartford and has covered 10,700 miles since leaving the Hub May 19.

Milwaukee Prepares for Show—The Milwaukee Automobile Club already has started preliminary preparations for the second annual motor show, which will be held in the new $500,000 Milwaukee Auditorium, dedicated last week. The show will again be held in the spring, but will be on a larger and more lavish scale. The Auditorium is only a block from the Hippodrome, which was used for the show this year. It is a fireproof structure, and is practically a solid monolith of concrete and steel. The arena is oval in shape. There are no stairs, these being obviated by a series of inclines. On the occasion of President Taft's visit to Milwaukee his car went from basement to roof, back to the arena, which it circled, and out through the basement, followed by twelve other cars.

Coming Motor Events

OCTOBER

2—Track meet of Milwaukee Automobile Club, Milwaukee, Wis.
2-3—Sociability run from Indianapolis to Mudiavia and return.
8—Duff trophy endurance run, Nebraska City, Neb., to Fall City.
9—Motor parade of St. Louis centennial week celebration.
9—Second annual Fairmount park road race, Philadelphia.
8-9—Reliability run of Louisville Automobile Club, Louisville, Ky.
8-9—Track races at Sedalia, Mo.
12-15—1,000-mile reliability run of Chicago Motor Club.
16-21—Show at state fair, Dallas, Tex.
23—Road races of Automobile Club of California, San Francisco.
27-29—Track meet at Vicksburg, Miss.
28-30—3-day track meet at Dallas, Tex.
30—Vanderbilt cup race.

NOVEMBER

3-13—Outdoor show at Salt Lake City, Utah.
6-13—National show at Atlanta, Ga.
9—Opening meet at Atlanta speedway.
22—Start of flag-to-flag reliability, Denver to City of Mexico.

DECEMBER

28-29—Philadelphia mid-winter reliability run.
31—Opening of Grand Central palace show, New York.

JANUARY

7—Closing of Grand Central palace show, New York.
8-15—Madison Square garden show, New York.

FEBRUARY

5-12—N. A. A. M. show, Chicago Coliseum.

Will Try Oil on Roads—The Bradford Automobile Club, of Bradford, Pa., will experiment with road oil shortly. It will have the Red Rock macadam road near Bradford oiled for a distance of a mile or so and will watch the result. If it is satisfactory the entire stretch and the other macadam roads thereabout will be similarly treated.

Buffalo Club Growing—The Automobile Club of Buffalo recently accepted forty-nine new members. It has been decided to inaugurate a series of lectures by technical experts at the club this winter. A change in the by-laws has been made whereby additional committees of the club will be appointed, to have charge of maps, road signs, contests and the club journal.

Helping Fix a Bridge—The Automobile Club of Syracuse has given $350 toward the completion of repairs on the free bridge over which it is necessary to travel on the main road between Syracuse, N. Y., and Rochester. As the bridge is on the line of the two counties, the state will not aid in its repair, and the counties being slow to act the neighboring clubs are advancing the money.

Texas to Build Club House—The Texas Motor Club will contract this fall for a modern club house which will be located in the country near Dallas. The Texas Motor Club, which has the largest membership of any club in the state, was organized last spring and owing to inability to find a suitable location for the club house nothing was done. In the meantime a number of officers and most of the members left Dallas for their vacations, and nothing is to be done until they return. It is expected a meeting of the club will be called some time in October.

Central New York Speed Traps—Speed traps in central New York are becoming numerous if not popular according to the list which the Automobile Club of Syracuse has just issued and posted in the hotels and garages. At Sennett between Syracuse and Auburn, a new trap has been sprung by Judge Pierson, of Owasco, who recently set a trap over a short bridge at the Owasco outlet near Auburn and arrested everyone who drove over it faster than 8 miles an hour. What authority he has to go outside of his town the club officers are at present trying to ascertain. Other traps mentioned in the list are at Elbridge, Vernon, Williamsville, West Winfield, Poughkeepsie, Albany, Utica and Schenectady.

The Motor Car Repair Shop

PACKING A WATER PUMP

THE methods of packing water pumps is as varied as the designs used in motors car construction, and no set rule will apply to all; but with a little ingenuity and the following hints any amateur mechanic should be able to stop a pump leaking. Where the leak occurs around the gland, Fig. 1, and repacking is necessary, pack the stuffing box B with heavy cotton cord or asbestos wick smeared with white lead, or better still, obtain some special coil packing as used on steam engines. This comes in nearly all sizes, is composed of a combination of rubber, fabric and graphite, and will outlast any other kind of packing. Care should be taken not to fill the stuffing box too full of packing—about half full is sufficient. A leak around the face of a pump rarely occurs unless the gasket has been damaged or a screw or two become loose or lost. If such a leak does not stop when all the screws are in place and tight, take the pump apart, make a new gasket of paper or asbestos sheet, apply white lead and assemble parts carefully.

When the face of a pump is removed by unscrewing it, as in the type shown in Fig. 2, a leak sometimes will be found around the face. This may generally be remedied by applying a little whitelead to the face of the pump casing F which bears against the cover C. If this is not successful however, a very effective method is to make a gasket of solder around the inner face of the cover as shown at B, then placing it in a lathe and machining it to the proper size as shown in A, to fit the face F of the male portion of the joint. In pumps where long, plain bearings are employed for the shaft and no packing gland and stuffing box are provided, when these bearings become worn and leak the only remedy is to fit bushings.

THE CARE OF CHAINS

If chains are allowed to run in a dirty, dry condition, they will not only cause unnecessary noise, but will wear out before their time. The chains always should be cleaned when they make a grinding or snapping noise, and this warning noise may develop in a very few days in a car that is running constantly in mud and water. If the car is operated on fairly dry roads the chains will run a much longer distance with the same attention. The most convenient way to clean and lubricate the chains is as follows: Shift the gear lever to neutral; start the motor; jack up the rear wheels and shift the gear lever to reverse speed, which will cause the rear wheels to turn over very slowly. As the

Hints For the Amateur

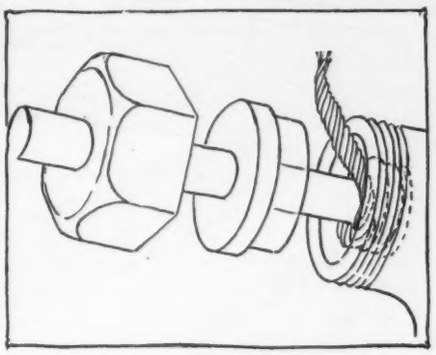


FIG. 1

rear wheels revolve and the chains are moving, squirt gasoline on them to cut away the dirt inside and out. If the chains are very dirty, clean them as well as possible with a brush before squirting on the gasoline. Avoid the use of a rag or waste for this purpose while wheels are revolving under power from the motor, for, notwithstanding the possible danger of losing a hand or some fingers, if a bunch of cloth or waste is carried onto the gear the chain may be broken or the gear, shaft or bearings severely strained or bent.

When the chains are thoroughly cleaned, stop the motor, take a handful of medium-grade grease and rub it all over the chains, turning the wheels and squeezing the lubricant into the rollers with the hands. This last is very important, as the friction is inside the chain, there being rolling action between the rivet and roller of the link. Work the grease between the rollers and the side links. Then wipe off the grease, as an accumulation of the grease would collect grit and wear the sprockets. This method is excellent on a tour when it is

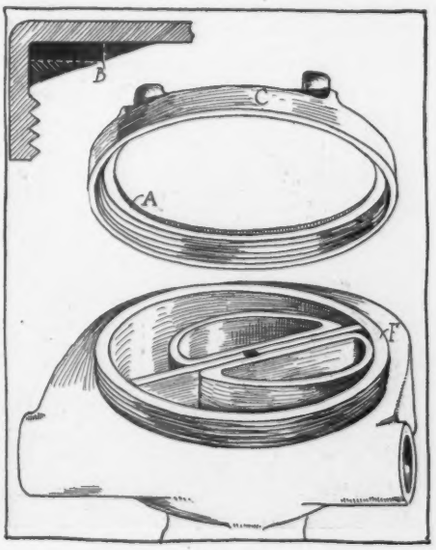


FIG. 2

inconvenient to remove chains and treat them properly.

Another and better method is as follows: Remove the chains and clean thoroughly in hot soda water or potash water, or if this is not handy, remove all grease and grit with gasoline, being careful to rinse the chain and shake it around in the gasoline so that the grit will be removed from between the inside and outside of the links and from the pin. Wipe dry, then put into a bath of hot tallow and plumbago, or graphite, which is the same thing; about one part of plumbago and seven parts of tallow is a good mixture, which should be at the boiling point of water, or above. Make a common practice of having this bath from 300 to 400 degrees Fahrenheit. In this state it is very thin and will run through and thoroughly lubricate the chain, carrying the particles of graphite with it. Leave the chain in the bath 15 or 20 minutes; then suspend the chain so it will drain. You probably will find that the chain will drain practically dry, as it should. If it does not, any excess tallow that may adhere to it should be wiped off. If the hot tallow and graphite bath is not available, soak the chains in warm oil.

WATER AND DIRT IN GASOLINE

It is reasonably safe to state that the origin of most carbureter troubles is dirt or water in the gasoline. Many people have this trouble and do not realize it. The motor stops, then the driver cranks and cranks without success. Then he looks for the trouble in every place but the right one, and either takes the carbureter apart and gets it out of adjustment, or else, if he is lucky and strong enough, he cranks until finally the water or dirt is sucked out of the carbureter nozzle and the motor starts without any apparent reason. Many motorists think chamois skin separates water from gasoline, because they frequently see a few drops of water left on the chamois. The fact is water, being heavier than gasoline, settles to the bottom, and the pressure and weight of the inpouring gasoline on the water forces it through the skin. Unless a trap is provided in the gasoline line leading to the carbureter, or the float-chamber of the carbureter is drained occasionally, trouble from this source is bound to ensue. However, the use of a chamois strainer is very good practice, and if the gasoline is poured into the funnel from a greater height and in less quantity, so as to keep the gasoline in the funnel in a constant turmoil, it will flow through the chamois faster, because the pores of the skin are kept free from deposits of water or dirt. Even if a little water does penetrate the skin no particles of dirt of sufficient size to be of any harm will be allowed to pass into the tank.

A MODERN MULTI-STORY FACTORY DESIGN

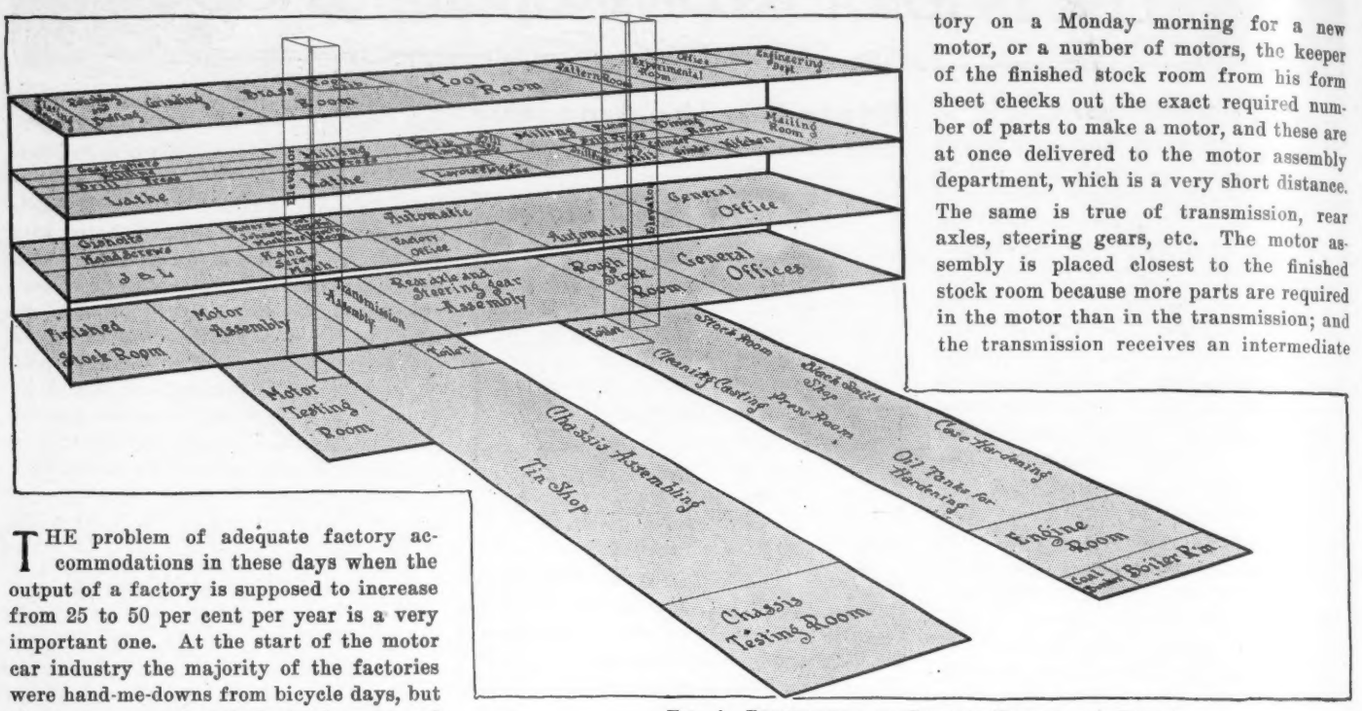


FIG. 1—PERSPECTIVE OF GARFORD FACTORY AT ELYRIA

THE problem of adequate factory accommodations in these days when the output of a factory is supposed to increase from 25 to 50 per cent per year is a very important one. At the start of the motor car industry the majority of the factories were hand-me-downs from bicycle days, but these soon proved entirely inadequate and enlargements were necessary. In such cases the only course to pursue was adding more buildings; today, however, the industry is experiencing a factory-building boom never experienced before, and much energy is being expended by many of the concerns on factory design.

Factories devoted solely to motor car construction divide themselves into two classes—the single story and the multi-story types. Originally the single-story faction had the majority of followers and it is a question if it has not at the present time, although the exponents of the multi-story type are finding new adherents every year. The favorite one-story design is the saw-tooth roof in which 50 per cent of the roof is glass with a north exposure so as to avoid the direct rays of the sun. The great prerequisite of a one-story factory is ground space as well as ample floor space for aisles, etc. A good example of the multi-story factory is the Garford plant, at Elyria, O., which is now used for the manufacture of the Studebaker-Garford chassis. This is illustrated in Fig. 1, and is a four-story building with two one-story wings extending from the rear of the main factory at right angles. The main building is but 45 feet wide and 400 feet long, and there are two elevator shafts for carrying raw products to the different machines on these floors and again returning it.

Theory of Economics Applied

The theory of economics as applied in this factory can be readily grasped. On the main floor of the factory proper as the two stock rooms, the rough stock room at the end in which the general offices are housed, and the finished stock room at the opposite end. In the right wing is also a rough stock room in which forgings, bar stock, flywheels, and scores of other parts are stored, after being unloaded from the railroad cars which are switched alongside of this wing. On the first floor of the main building, between the two stock rooms, are the assembly departments, the motor assembly, adjacent to the finished stock room; next to it comes the transmission assembly and finally the rear axle, front axle and steering gear assembly. All of these assembly departments are conveniently located near to the finished stock room in which all of the finished parts entering in the make-up of these are stored: Thus, when an order is placed in the factory on a Monday morning for a new motor, or a number of motors, the keeper of the finished stock room from his form sheet checks out the exact required number of parts to make a motor, and these are at once delivered to the motor assembly department, which is a very short distance. The same is true of transmission, rear axles, steering gears, etc. The motor assembly is placed closest to the finished stock room because more parts are required in the motor than in the transmission; and the transmission receives an intermediate place because of the fewer parts needed in the axle and steering gear parts. This arrangement of the first floor is intended to reduce the handling of finished parts entering into the make-up of the motor, transmission and axles to a minimum.

Departments Conveniently Located

There still is another reason for the location of the motor assembly room adjacent to the finished stock room, this being that the motor-testing room is conveniently located so that a motor once finished has not to be transported more than 40 feet to the test room. To go still further, the motor-testing room is in the angle between the first floor and the chassis assembling.

FIG. 2—GENERAL VIEW OF MACHINE SHOP ON THIRD FLOOR

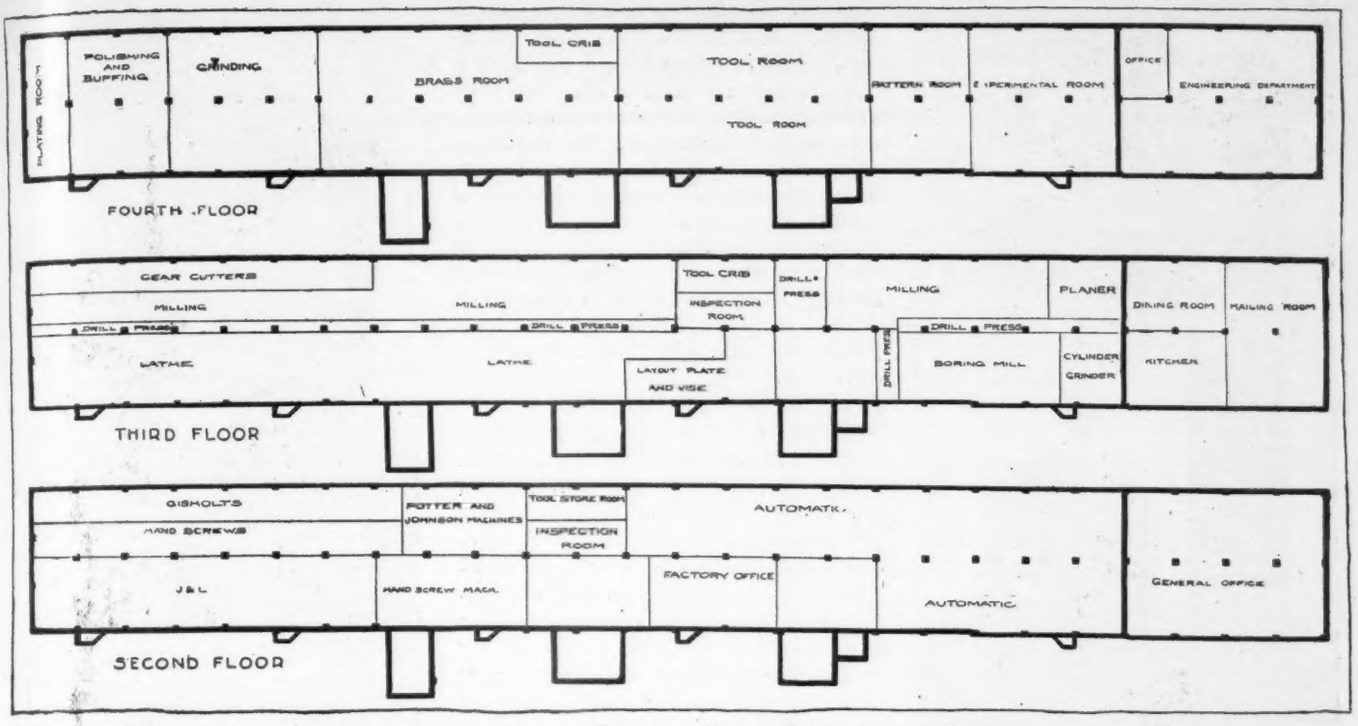


FIG. 3—PLANS OF SECOND, THIRD AND FOURTH FLOORS GARFORD FACTORY

In this chassis assembling the frames are drilled and the axles, motors, transmissions and all other chassis parts put in place. The convenience of this arrangement is apparent in that there is little time lost in transporting the parts from the assembly departments on the main floor to the general chassis assembling in the wing. In one part of the wing space also is devoted to the tin shop in which are made the fenders, gasoline tank, bonnets, underpans and other parts. These are conveyed direct from this department to the chassis assembling. There is thus in this scheme of layout perfect accord in economy in the transporting of finished parts to the general assembly room whence they take their final place in the chassis.

In the right wing, in addition to the rough stock of the heaviest nature, the forge hammers, hardening ovens, and other heavy machinery parts are located. All of the brazing is done in this room, as is the heavy blacksmith shop work. This might be termed "the noise and heat room" of the factory. Located in the end of the wing is the power plant for the entire factory.

Interesting Factory Layout

The second, third and fourth floors of the main factory afford an interesting study in factory layout. The second floor is devoted exclusively to automatic machinery. Some of the parts being manufactured on this floor being cap screws, bolts, nuts, thrust rings for bearings, cups and cones for ball bearings, cam rollers, washers, valve lifters, and in brief many other parts of the car. On this floor is located the factory office, so that the factory superintendent is practically as near the center of his field of operations as possible, there being but two floors above him and practically as much beneath. It might be argued that these automatics, in view of the fact that nothing but small parts are made by them, should be located on top the top floor of the building, so that there would be little expenditure of power in carrying heavy materials to the third or fourth floors. This is rendered impossible because it would call for much heavier construction to carry the heavy automatic machinery higher than the second floor.

FIG. 4—AUTOMATIC MACHINERY OF SECOND FLOOR

On the third floor the heavy work is done. Here all the milling and drilling of the aluminum crankcases and gearboxes is accomplished. In one corner the grinding of the cylinder castings takes place. This is the general machine shop floor and on which all of the lathe work takes place. It is necessary to bring all of the heavy castings to this floor by way of the elevators and return them to the first floor when finished, but the loss of power in elevating them is very small. It is possible in a factory of this nature, however, to have a construction strong enough on the third floor to support the various types of machinery needed in this work, whereas the automatics would be too heavy. In the center of this room is a tool crib and beside it an inspecting room where all of the parts are inspected before finally delivered to the finishing stock room.

Light-Work Department

The top floor is esesntially light-work department which makes possible reason-

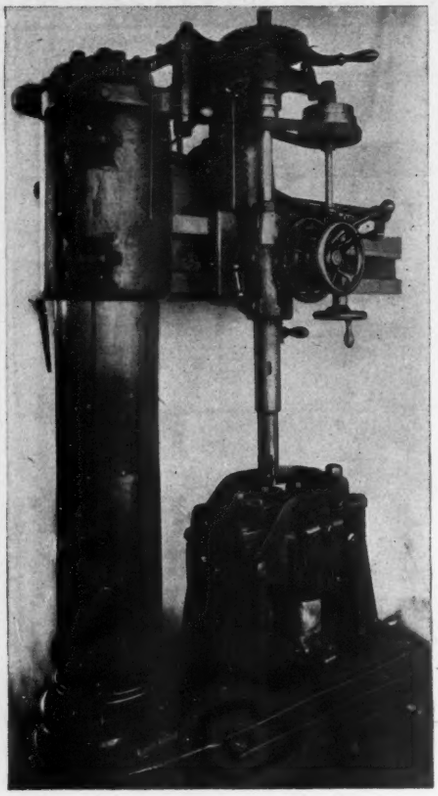


FIG. 5—BORING MOTOR CYLINDERS

ably light factory construction. In one end is the plating room where all of the electro plating is done. Next to it is the polishing and buffing department in which all brass parts are polished before being delivered to the stock room. Next to this department comes the grinding in which all of this work is done with the exception of grinding the cylinders which takes place on the third floor. The grinding done in this department includes wrist pins, camshafts, piston rings, cups and cones for ball bearings, and many other parts. In the brass room are machined camshaft bushings, hub caps, fan pulleys, valve-lifter guides, carbureter parts, water pumps, castings, and control levers. These are all finished complete here, and at once dispatched to the stock room. This floor also has a tool crib for the convenience of the workmen on this floor. The remainder of this floor is devoted to a tool room where jigs for new models are made, a pattern room, experimental room, and the engineering department with its office. In the engineering department all of the drafting is carried on. It is particularly convenient to have this close to the experimental room, where all new work is carried on.

Admirable Lighting Facilities

One of the features of a factory of this nature is the admirable lighting facilities. With a floor width of but 45 feet and a full wall of windows on each side above the tool benches, there is nothing whatever to prevent the best possible light in all weather. The value of good light has been proven on many occasions in different factories where it has been shown by the meters on the electric switchboards that the machines do more work when there is natural light than when there is artificial light, in that they consume more current. The only explanation of this is that the men work better with the natural light. Besides excellent lighting arrangements this type of factory is well suited for heating and ventilation. The sanitary conditions are looked after to the greatest possible extent.

RAINIER IN TRUCK FIELD

The recent incorporation of the Rainier Motor Truck Co. in New York state marks the return of the Rainier interests to the commercial vehicle field. John T. Rainier and P. N. Lineberger, who have been identified with the Rainier company since its inception, together with George Carlton Comstock, are the incorporators of the new company. A contract has been entered into with the Reliance Motor Truck Co., of Owosso, Mich., whereby the Rainier Motor Truck Co. will market Reliance gasoline trucks in the east, and it is proposed to offer the purchasers a maintenance contract whereby for a stated sum per annum the trucks will be kept in repair for a term of years and their operation guaranteed. On September 21 the Rainier Motor Truck Co. closed a lease with the Astor estate for a large piece of property on Fifty-first street and Twelfth avenue, New York city, where a commodious garage and repair shop will be opened immediately.

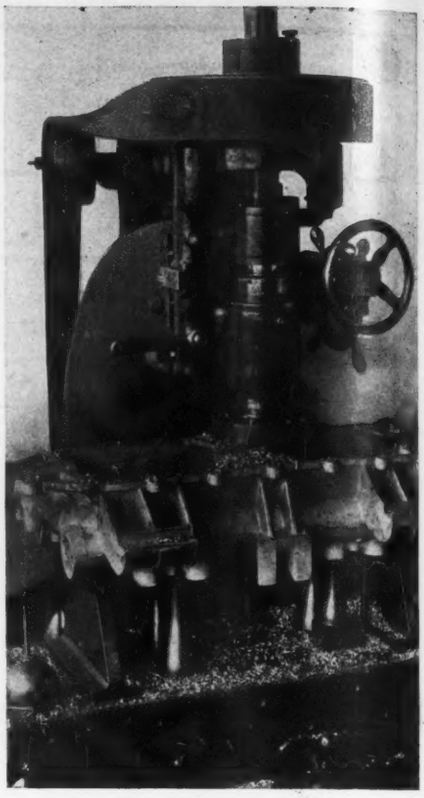


FIG. 6—MILLING CRANKCASE

FIG. 7—GENERAL VIEW OF ASSEMBLY ON FIRST FLOOR GARFORD FACTORY

Development Briefs

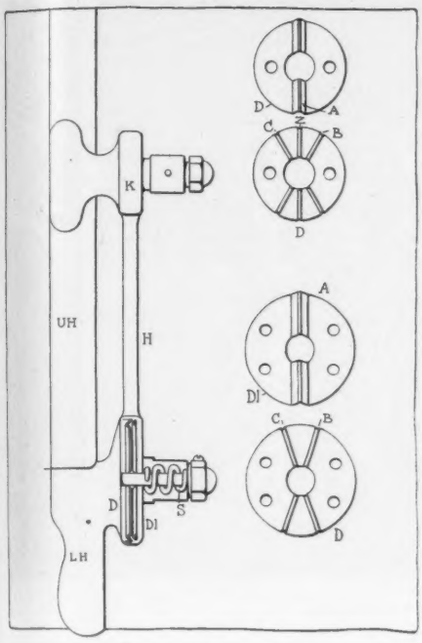


FIG. 1—TROY WINDSHIELD FASTENING

Troy Sextette Wind Shields

THE Troy Carriage Sunshade Co., Troy O., has brought out a new design of automatic wind shield for the coming season known as the Automatic Sextette. In this wind shield the upper half can be placed automatically in many desired positions by simply seizing it by the hand and pushing it to the position wanted, where it is automatically locked. The method of automatically locking this shield is illustrated in Fig. 1, in which UH is the frame work of the upper half of the wind shield, H the hinged arm, and LH the lower half of the shield, or the support on which the upper half swings. The automatic locking features consist of two grooved disks, D and D1, acting in conjunction with a spring, S, under tension. The disk D attaches rigidly to the lower half LH of the framework and carries in it a pair of diametric grooves, B and C. The disk D1 is attached to the hinged part H and carries a diametric corrugation A, which is designed to fit into the grooves B or C, and is held therein by the spring S. By pushing the top half through the hinge H the tongue A can be forced out of groove C and pushed until it locks in groove B, when there will be a new position for the wind shield. Attached to the upper half is a bracket, K, within which is another double disk device, similar to that on the bracket LH, so that by means of it the upper half, UH, of the wind shield can be set in several different positions without any swinging whatever of the hinge H. This gives an additional adjustment of the shield. The disks within the bracket K differ from those in the bracket LH in that one disk has three diametric grooves, C, Z and B, in disk D, but only the one corrugation in disk D1. The three grooves give additional angles of position for the upper half. This shield has six positions: First, the vertical; second, when the top half folds on top of the slanting lower half; third, with the hinge H vertical and the top half parallel with the lower half for rain use; fourth, with the top half forms a slanting continuation with the lower half, in which it is designated a wind scoop; fifth, when the top half inclines forward or practically at 90 degrees to the lower half; sixth, the top half vertical but swung back closer to the steering wheel. Fig. 3 shows the first four positions. This wind shield is also made with a vertical lower half for touring car purposes and as such has six positions in which it automatically locks.

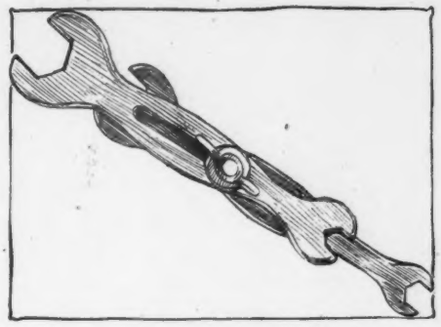


FIG. 2—THE RONSON WRENCH

New Kilgore Absorber

The Kilgore Mfg. Co., Boston, Mass., since its reorganization, has continued the manufacture of the Kilgore shock absorber and has it ready for the 1910 market, with improvements. As illustrated in Fig. 4, this is an air or pneumatic absorber, in which the piston, P, attaches through its rod and a universal coupling, V, with the frame of the car and the cylinder, C, attaches through a similar universal coupling, V1, to the axle. The theory of operation of the shock absorber is that the air passing from the space, S, below the piston to the space, S1, above it must pass through a side channel, B, in the cylinder wall, this channel having an opening, D, into the space, S, and an opening, A, into the space S1. The restricted size of these openings and the passage B retards the piston P on its up or down stroke, thereby absorbing the jar. The flow of air through the ports D and A may be controlled by a valve, H, the upper end of which, at K, is beveled so that by turning this valve the beveled portion partially or entirely closes the opening D.

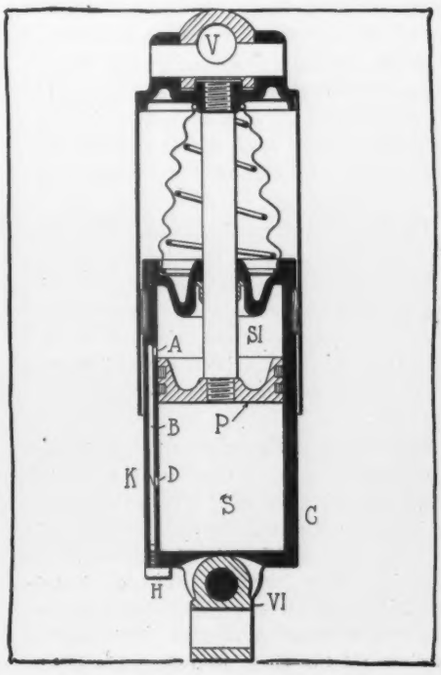


FIG. 4—KILGORE SHOCK ABSORBER

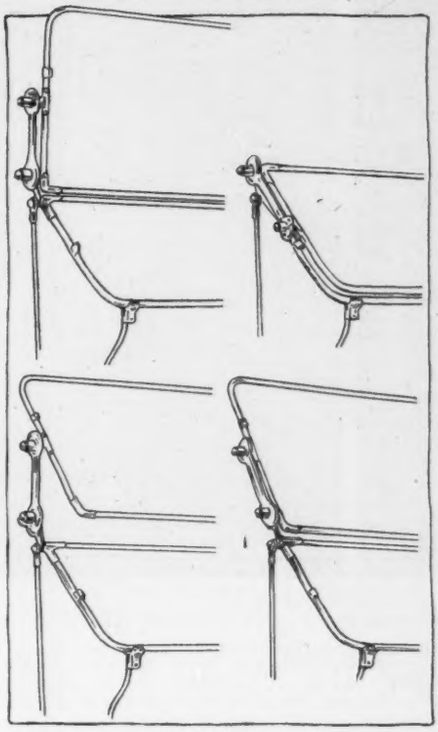
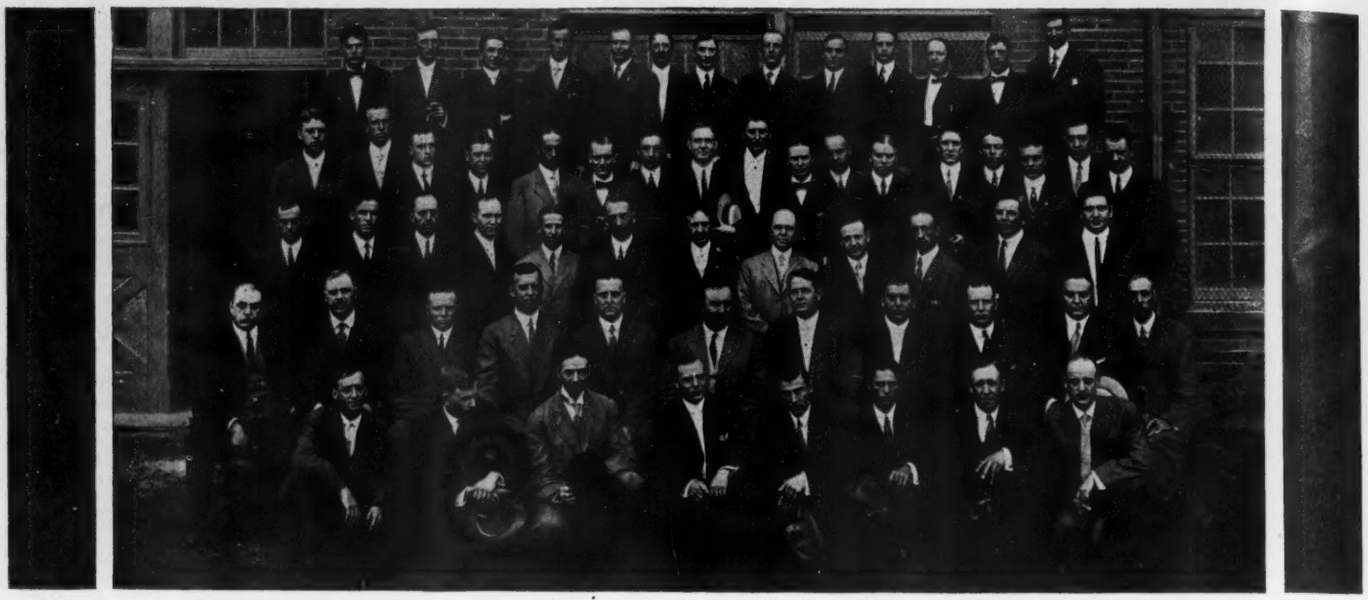


FIG. 3—TROY WINDSHIELD POSITIONS

The Ronson Wrench

Cryder & Co., New York City, are marketing the Ronson wrench, which is a combination of nine wrenches, although the entire tool is but 6 inches long and weighs 8 ounces. The nine wrenches it is capable of being converted into range in size from 3/16 to 13/16 inch. The wrench, Fig. 2, consists of four members, each made of plate steel. These four parts are secured together by a center bolt and winged nut, so that when one of the ends is pulled out for use the remaining ones form a handle with the wing nut resting between the fingers.

Among the Makers and Dealers



SALESMEN'S CONVENTION OF FIRESTONE TIRE AND RUBBER CO. AT AKRON, O.

Back row—H. G. Bender, J. W. Thomas, D. B. Price, W. T. Brown, O. A. Lazenby, B. N. Beedon, William Eckel, W. E. Fouse, A. R. Rockwell, J. E. McGinness, W. C. Mayville, J. M. Doyle, A. L. Schavoir.

Fourth row—A. G. Partridge, C. P. Sanders, P. B. Talbott, W. F. Ridge, W. W. Robertson, R. T. Smith, J. V. Spencer, R. W. Phelps, R. D. Barr, J. Howard, R. S. Breckenridge, A. W. Moore, J. H. Irwin, F. H. Burt, F. M. Moore, C. O. Dall, R. H. Turner.

Third row—F. Z. Binkard, Ole Hibner, F. O. Sawyer, F. R. Robinson, S. G. Carkhuff, Will Christy, H. S. Firestone, A. C. Miller, R. J. Firestone, Charles Habhegger, W. L. Esterly, F. H. Smith.

Second row—G. A. Talbott, W. H. Rowerdink, J. V. Mowe, C. E. Jackson, D. C. Swander, O. O. Petty, W. A. Harshaw, F. H. Martin, W. R. Walton, T. J. Glenn, N. B. Burwell.

First row—P. B. Bosworth, R. E. Warner, G. H. Pumphrey, J. G. Robertson, J. A. Smith, C. A. Hagberg, R. V. Smith, J. F. Singleton.

Carr With Fuller—J. V. Carr has been made sales manager of the Fuller Power Truck Co., of Delphos, O.

Handling Doolittle Rim—Robert S. Miner, of Hartford, Conn., has taken the representation for Hartford and Tolland counties of the Doolittle demountable rim.

Apperson Agent to Build—The Joseph F. Gunther Co., representing the Apperson in Chicago, will build at Indiana avenue and Thirty-third street. The Brush also has joined the southern movement and will build on Michigan avenue near Twenty-third street.

Le Roux a Branch Manager—George N. Le Roux, formerly assistant manager of the Chicago branch of the B. F. Goodrich Rubber Co., assumed the management of the Denver branch this week, succeeding Thomas S. Davidson. J. J. Breen, who has been with the Denver branch the past year, will make Akron his headquarters hereafter.

Dinner Planned for Willys—A greeting and welcome in the shape of a dinner at the Toledo club will be extended to J. N. Willys, president of the Willys-Overland Automobile Co.; Isaac Kinsey, president of the Kinsey Mfg. Co., and T. W. Warner, president of the Warner Mfg. Co., on Saturday night. These men and nine other heads of departments of the three new plants which have located in Toledo within the past few months, joined the Toledo club in a body a few days ago. Clarence Brown will preside as toastmaster.

Starting In at Ripon—E. A. Butzke, a carriage and wagon manufacturer of Ripon, Wis., and H. S. Hart, of Milwaukee, have opened a garage in the three-story building at Jackson and Blackburn street, Ripon. Mr. Hart will be manager.

Starts a Repair Shop—H. P. Bowser, formerly of the Homewood Automobile Co., of Pittsburg, has opened a large repair shop at 7001 Kelly street and will operate under the name of the Belmar Automobile Repair Co.

Chicago Continental Branch—The Continental Caoutchouc Co. has opened a branch at 1412-14 Michigan avenue, Chicago. This branch supplies owners, dealers and manufacturers throughout the middle west and has been created to care for the growing demand for Continental products.

Maxim to Sell His Electric—Negotiations are under way for the sale of the Maxim-Goodridge electric car. The vehicle was designed by Hiram Percy Maxim, formerly engineer of the Electric Vehicle Co. He has since the inception of the electric which embraces new constructive features, patented a firearms muffler. This device requires all his time, therefore his intention to sell the car. T. W. Goodridge, associate of Mr. Maxim, also has formed another business connection. The Maxim-Goodridge electric utilizes a worm drive.

St. Louis' Latest—The Missouri Motor Car Co., of St. Louis, has recently incorporated and is the distributor in St. Louis territory for American Simplex and Marmon motor cars.

Organizes Supply Company—The Wordingham Auto Supply Co. has been incorporated in Milwaukee, Wis., with a capital stock of $5,000. William Wordingham, Thomas W. Sheriffs and George D. Sheriffs are the incorporators.

'Frisco Moves—The Lexington car has been introduced into San Francisco by F. L. Burkhard, of the Burkhard-Crippin Auto Co. The Elmore car has again been placed on the San Francisco market by A. J. Smith, the Pacific coast agent. He has taken quarters with the Reliance Automobile Co.

Maxwell Has Hoosier Branch—The Maxwell-Briscoe Motor Co. has completed arrangements for building a sales branch in Indianapolis, having leased ground at Illinois and Vermont streets. A building to cost from $50,000 to $60,000, and which will be one of the finest salesrooms and garages in the city, is to be erected immediately. At the present time the company has temporary quarters at 318 East Market street, which is in charge of J. W.

Hayden. Until recently the Maxwell has been handled in Indianapolis by the Fisher Automobile Co.

Morgan Davis Changes—Morgan R. Davis, former manager of the Penn Motor Car Co., of Philadelphia, has accepted a position with Nerling & Co., of Pittsburg, who will handle the Autocar and the Corbin here this year.

Another Overland Plant—An accompanying illustration shows the site of the new Overland finishing department, on which ground has been broken for a new brick structure 600 feet long, 100 feet wide and five stories high.

Locates at Lancaster—The Fairfield Automobile Co., of Baltimore, has been formed by J. F. Albright, C. C. Fultz, J. W. Lake, O. Osborne and A. M. Neff with a capital of $20,000 and will locate at once in Lancaster, O. A plant will be fitted up there with a garage and repair shop.

New Great Western Out—The first Great Western car of the 1910 model to come out of the factory, shown in an illustration, on page 43, is a baby tonneau intended for four people, but which seats five comfortably. Seated in front are William Crossley, engineer, who is driving, and E. Mack Morris, general manager. In the rear seat are Paul Creighton, superintendent; R. H. Bouslog, secretary and treasurer, and R. A. Edwards, director.

Another Minneapolis Maker—If present plans work out and the prospects seem good, Minneapolis will add another car manufacturing plant to its list within the next 60 days. The Minneapolis Motorcycle Co. has been reorganized, and incorporated at $150,000. In addition to a much larger output of these machines, a new runabout costing less than $1,000 will be made. This machine will be known as the Star. Fred Starr and Al Johnson are to have charge of the car end of the new firm's business and are now in the east buying materials. The new Star car will have a 24-horsepower motor, 34-inch wheels all around, and selective transmission. Five hundred cars will be made in the first lot, it is stated, and the first car will appear about December 1. Two factories are now

ANOTHER ADDITION THAT IS BEING MADE TO THE OVERLAND PLANT

owned by the new company, which has not been named as yet, and in the spring ground will be broken so that all the work will be under one roof.

Oklahoma's Big Business—The motor car busines is booming in Oklahoma. The Lee Motor Car Co., of Oklahoma City, alone has just placed an order for 360 cars, the largest order ever given from that state.

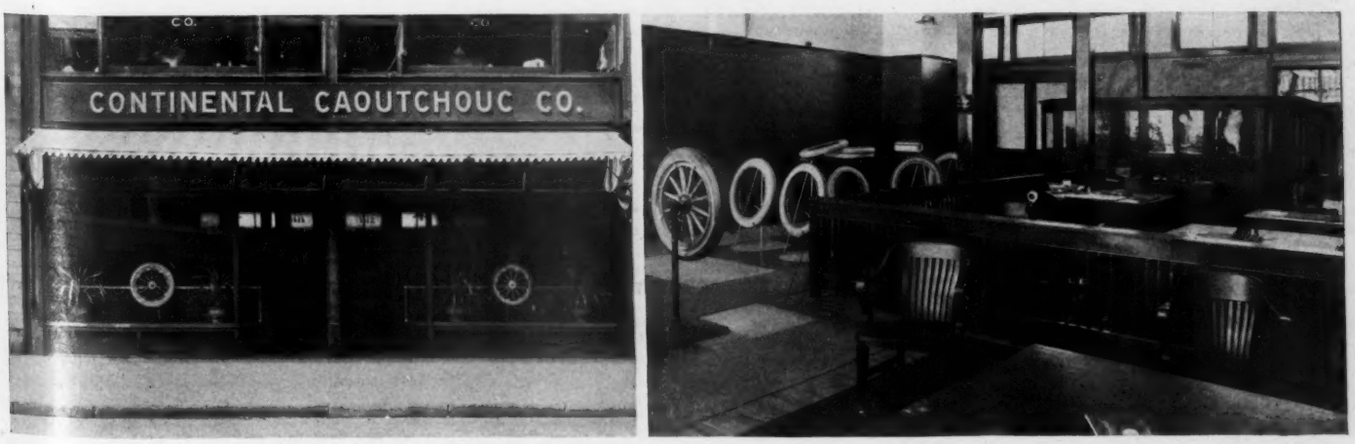
Will Make Light Trucks—The H. Lange Wagon Co., of Pittsburg, which was established in 1875, will by January 1 be turning out light delivery trucks at a rapid rate. C. G. McCormick and Elias Lange have charge of the new plant.

New Tire Company Starts—John L. Coesir, who recently invented a clincher tire, has organized the Coesir Tire and Rim Co. in Indianapolis with a capital stock of $100,000 and the company will establish a large plant as soon as arrangements can be completed. Members of the company besides Mr. Coesir are George T. Fish, Edward S. Bertsch, Oscar Hermann, John C. Clark, George W. Benedict and Paul F. Robinson. The tire is fitted with a steel rim and an inside clinching device that can be fitted either to single tube or to double tube tires.

Takes On the Moon—The Moon car will hereafter be handled in Minneapolis, the agency having been given to the Segerstrom Auto Co. which now handles the Rider-Lewis.

Will Show at Atlanta—The Vehicle Top and Supply Co., of St. Louis, will exhibit the Vesco top at the Atlanta show. The 1909 season just closing has exceeded by nearly 33⅓ per cent the expectations of the company.

Stewart & Clark Branch—The Stewart & Clark Mfg. Co., of Chicago, has leased for 3 year the quarters occupied by the Cadillac Automobile Co., of Chicago, at 1312 Michigan avenue, and will take possession December 1. The new quarters will prove a great convenience for city trade, as it will permit taking care of city orders promptly, avoiding delays of handling the order through factory. A large crew of installers will be on hand, so that speedo-

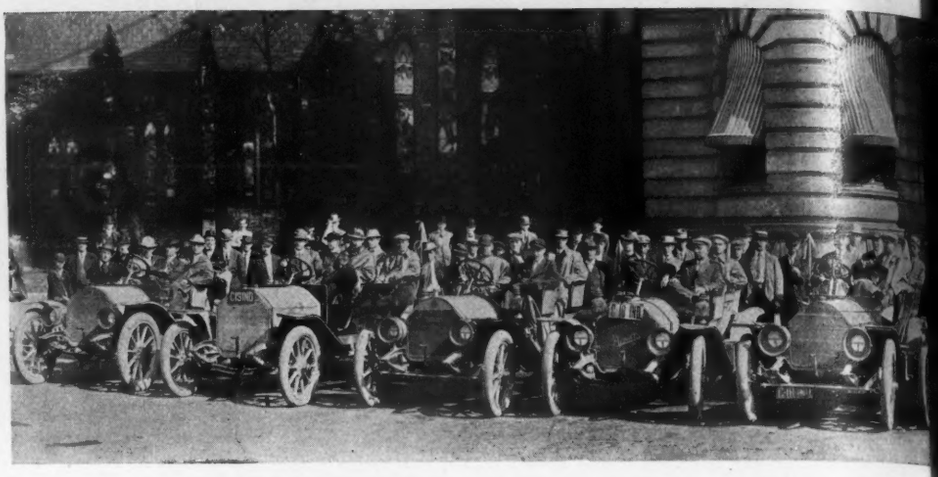


EXTERIOR AND INTERIOR OF CHICAGO BRANCH OF THE CONTINENTAL CAOUTCHOUC CO.

meter installations can be taken care of there in place of sending the cars to the factory as heretofore.

Buys Auburn Garage—George Codington and Harry Furlong have purchased the brick garage business of L. A. Newman, in Auburn, Neb. Albert Hutton will conduct the business.

Premier Session Ends—The annual meeting of agents of the Premier Motor Mfg. Co. was concluded last Thursday night with a theater party at the Grand opera house, Indianapolis. It is said that a more enthusiastic meeting, or one showing more coöperation on the part of the agents has not been held. There were no special incidents connected with the run to French Lick and return on Wednesday and Thursday. The run was from the factory at Indianapolis to French Lick and return which is a 286-mile trip. Five of the cars in the run never had turned a wheel, being new chassis just assembled. Two of these five were of the six-cylinder type. One of the six-cylinder engines was mounted on the frame at 10 o'clock Monday, the other at 6 o'clock Monday night, and the cars started on the trip Wednesday morning. All of the cars left the factory without a single spare part or tools beyond a pair of pliers. The entire distance of 286 miles was made without a replacement or adjustment of any kind excepting a little adjusting of the carbureter at the start. On two of the test cars in the run the wheel connections beneath the carbureter pipe and tank pipe became cloggged. Included in this run was the original Premier pilot car which laid out the 1908 Glidden and later acted as a pilot in this tour. It has mileage of over 50,000. Another was the old Premier Century car which has covered more than 30,000 miles. Two other cars which have previously performed in other contests were the Glidden tour machines of this year. At stated intervals along the route, the dealers were changed from one car to another. Thus every dealer had an opportunity of covering a portion of the trip in each of the cars, a sufficient distance being allowed to thoroughly demonstrate to them the consistent roadability of the Premier product.



PREMIER AGENTS WHO ATTENDED ANNUAL SESSION OF DEALERS AT INDIANA

Smith Increases Capital Stock—The A. O. Smith Co., of Milwaukee, Wis., manufacturer of pressed steel frames and parts, has increased its capital stock from $500,000 to $1,200,000. The company is now erecting a new plant at a cost of $500,000 and will greatly increase its capacity.

Building Big Repair Shop—A three-story brick building has been leased at 444 South Illinois street in Indianapolis by the Buick Motor Car Co. and will be used as a repair shop. A full supply of parts will be carried. This building will be in addition to the company's three-story sales room in East New York street.

Buick Adds to Plant—The Buick company has started work on two more buildings at its plant at Flint, Mich. One building will be a wing to parallel the wing of the main building. It will be 150 by 55 feet and three stories in height. To connect this with the present wing a building 112 by 21 feet and one story high will be erected. Modern machinery for the hardening of steel by a new process will be installed. In the one-story building locker rooms for the employes will be installed and also a big dining room. The two buildings will represent an expenditure of $50,000.

Goes to Detroit—Charles Gordon, of the Whitlock Coil Pipe Co., of Hartford, Conn., has severed his connection with that concern and has removed to Detroit, where he will be identified with the motor car industry.

Another Prest-O-Lite Branch—As the result of an increasing demand in the northwest during the past 6 months, the Prest-O-Lite Co., of Indianapolis, has decided to open both a local branch and a factory as well in Minneapolis. Sites are now being inspected.

Diamond to Open Branch—The Diamond Rubber Co. will open a tire branch house in Denver October 1, with Charles C. Collins as manager. The salesroom is located at 1633 Court place. Thomas S. Davidson, formerly manager of the Goodrich branch is associated with Mr. Collins.

New Dorris Nearly Ready—The Dorris company, of St. Louis, will be ready in a few days to put its 1910 model on the market. The factory is being reconstructed, a third story having been decided upon as necessary to care for the firm's growing business. The new Dorris will be put out of the factory completely equipped. That means that this year it will leave the shop with top, dust cover, wind shield, speedometer, tire irons, tools, five lamps and tank.

Columbus Agencies—Agencies for 1910 in Columbus, O., have been announced as follows: F. E. Avery, Packard; Robert F. Boda Automobile Co., National and Mitchell; Broad-Oak garage, Chalmers-Detroit, Hudson and Pierce-Arrow; Curtin Williams Co., Winton and Cadillac; H. C. Crum & Co., Regal; Franklin Motor Car Co., Franklin; Miller-Matthews Co., Jackson and Premier; O. G. Roberts & Co., Stoddard-Dayton, Cleveland, Ford and Lexington; Snyder Automobile Co., Rambler; A. J. Pray, Studebaker and E-M-F; Frank

BANQUET OF PREMIER DEALERS IN DENISON HOUSE AT INDIANAPOLIS

AFTER THEIR RIDE TO FRENCH LICK AND RETURN LAST WEEK

Corbett, Maxwell; United States Carriage Co., Apperson.; C. Roy Clough, Velie and Hupmobile.

Butcher Buys Motor Wagon—Dogan & Deffry, meat market proprietors at Kenosha, Wis., have purchase a light motor delivery wagon with a specially designed refrigerator body, to supply their trade in and around Kenosha.

Starts Supply House—The Brown-Bailey Auto Goods Co. is the name of a new supply house which will open at 1460 Cleveland place, Denver, on October 1. The members of the firm are H. R. Brown and J. H. Bailey, both of whom are long residents of Denver.

Pope Joins Matheson—Harold L. Pope, formerly with the Pope Motor Car Co., of Toledo, and whose connection with the Overland Automobile Co. was severed recently, left this week for Wilkes-Barre, Pa., where he has become associated with the Matheson Motor Car Co.

Will Make New Spring—A shock-absorber company has been opened in St. Louis to exploit the Kentzinger patent spring for motor cars. The incorporators are Charles E. Hayden, Charles H. Clouston and Clement M. Kentzinger. The company plans to begin soon the manufacture of the spring on a large scale.

Joins St. Louis Colony—The Petrie-Phillips Automobile Co. is the latest concern to be organized in St. Louis. It will handle the Parry. C. G. Petrie is president, Jerome Phillips treasurer and Roy Britton secretary. The firm is furnishing salesrooms at 1127 Olive street, where it has leased a building for a term of years.

Big Order of Falcars—C. F. Van Sicklen, assistant sales manager for the F. A. L. Motor Co., of Chicago, closed last week one of the biggest deals ever completed in the northwest. He arrived in Minneapolis overland and inside of 24 hours he had closed for 950 cars with the Northland Motor Car Co., of which W. D. Rightmire and Harold Vorce are the moving spirits. Stoddard-Daytons are also handled. Van Sicklen then started on a trip to Omaha. Applications from some thirty Minneapolis and St. Paul agents had been sent to the F. A. L. company previous to Van Sicklen's arrival in Minneapolis.

Firestone Convention—At the 1909 Firestone tire men's convention there were about eighty in attendance, great enhusiasm being displayed over the next year's outlook for tires and demountable rims of the Firestone type.

Another For Omaha—The Western Motor Co. is one of the new concerns to start in Omaha. The company will do business at 1920 Farnam street in the old stand of the electric garage, which has taken new quarters farther up Farnam street. The members of the firm are William H. Horn president; Harold L. Pritchett, vice-president; John W. Madden, secretary and treasurer.

Another Car Maker—H. Leadbetter, Jr., manager of the Toledo branch of the Flint Wagon Works, of Flint, Mich., with territory comprising Indiana, Ohio and western Pennsylvania, has announced that his company will extend its lines and engage in the manufacture of motor cars. The concern will put out a popular-priced machine to be known as the Whiting. A runabout and two styles of touring car will be manufactured, the entire work being done at the Flint plant. These cars will be ready for the 1910 season.

In Temporary Quarters—The new San Francisco branch of the Franklin Automobile Co. has secured temporary headquarters at 404-406 Golden Gate avenue, which it will occupy until January 1.

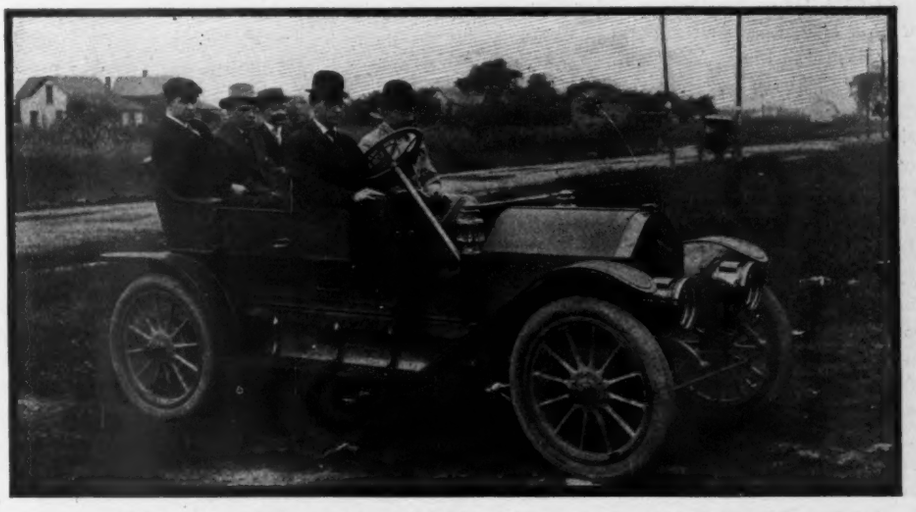
Veteran In Charge—The Studebakers have placed Robert G. Pilkington in charge of their commercial gasoline motor car work at Detroit. Mr. Pilkington began this class of work in 1899.

Pope Declares Dividend—At a meeting of the directors of the Pope Mfg. Co. held in New York city a dividend of 6 per cent was declared for the fiscal year ending July 31, 1909, and payable September 30, 1909, to stockholders of record at the close of business September 29.

Garage Fire in Seattle—Because a mechanic lighted a match in the garage of William H. Heinzerling, on Broadway between Pike and Pine streets, Seattle, Wash., just before midnight, the building was gutted and some twenty machines were destroyed, causing a loss of $80,000. The mechanic was working at a Seeing Seattle car.

Change at Warren—W. A. Williams and O. D. Morgan, of Warren, O., have taken over the business of the Reliance Machine Co., on East Market street, in that city, and will handle the Maxwell. H. H. Bear will be manager of the new concern. A new plant will be built on the west bank of the Mahoning river to provide for a large repair shop.

Has Parade of Its Own—The Johnson Service Co., of Milwaukee, Wis., maker of Johnson gasoline cars and trucks, took advantage of the crowds that gathered in Milwaukee during the recent state fair to give a motor parade, showing all types of vehicles it produces. Touring cars were followed by roadsters, and the fourteen special cars manufactured by the Johnson company for the government and used by the Milwaukee postoffice bringing up the rear.



FIRST OF THE GREAT WESTERN 1910 MODELS, WITH COMPANY OFFICIALS

Brief Business Announcements

Atlanta, Ga.—E. D. Crane & Co., of 44-46 Madison avenue, have been appointed agents for the Firestone cars.

Atlanta, Ga.—F. J. McConnell, of the firm of McConnell & Kurfees, has secured the local agency for the Moon.

Plainfield, N. J.—The Morris Auto Co. has been sold to Clarence B. Brokaw. George B. Morris, the former manager, has left for Colorado Springs, Colo.

Boston, Mass.—Edward M. Goding, of this city, has been appointed receiver for the American Automobile Engine Co., which recently filed a petition in bankruptcy.

Trenton, N. J.—Articles of incorporation have been filed by the Jones Taximeter Co. of the Southwest, of East Orange. The company has a capital stock of $10,500, and is backed by C. O. Geyer, F. E. Ruggles and others.

Taylor, Tex.—Work has been commenced on the erection of the new garage which is to be erected for Carl Grau. Mr. Grau is the representative for the White company and his new building is to be located on East Fifth street.

Trenton, N. J.—The Maxwell-Briscoe Toledo Co., of Jersey City, has been incorporated with a capital stock of $2,000. The incorporators are S. A. Anderson, L. H. Gunther and H. O. Coughlan, of Jersey City. The Maxwell-Briscoe Columbus Co., also of Jersey City, has been incorporated with a capital of $2,000.

Flint, Mich.—The W. A. Patterson Carriage Co., of this city, which is well known as a maker of carriages, has decided to go into the motor car field and is putting on the market a new car to be known as the Patterson Thirty. A number of agencies have already been placed, one of the most important being for Pittsburg, which has been placed with the East End Auto Co.

Atlanta, Ga.—The Corker Motor Car Co., of this city, has been appointed agent in Georgia, Florida, Alabama, Tennessee, North and South Carolina for the Haynes. This company has been organized recently with S. A. Corker as president; E. H. Ellerby, secretary and treasurer; M. L. Fuller, manager for out-of-town sales, and C. H. Alexander, city salesman. This company is also the local agent for the Matheson.

Atlanta, Ga.—A new company has been formed under the name of the Overland Southern Motor Co. and will represent the Overland car in Tennessee, North and South Carolina, Georgia, Florida, Alabama, part of Virginia and the West Indies. H. L. Hopkins is to be the president of the company and R. C. Smith, formerly with the Reo company, is to be sales manager. The headquarters of the company will be located in the Peachtree Auditorium for the present and a permanent location will be secured later.

Albany, N. Y.—The Auto Spring Repairer Co., of Brooklyn, has been incorporated with a capital stock of $20,000.

Lansing, Mich.—Articles of incorporation have been filed by the R. B. Hawley Motor Works, of Jackson, with a capital stock of $5,000.

Atlanta, Ga.—F. C. Steinhauer, who is agent for the Packard, Pope-Hartford and Cadillac cars, is to remove to 328 Peachtree street, where he has fitted up a garage.

Columbia, S. C.—The E. A. Jenkins Motor Co. has disposed of the garage and repair department of its business and in the future this will be operated by C. B. Onslow and M. C. Elliott under the name of the Independent Auto Repair Co. The Jenkins Motor Co. is the local agent for the White, Stoddard-Dayton and Reo, and intends to devote all its interest to pushing the sales of these cars.

Adrian, Mich.—The Lion Motor Co., which was recently organized in Detroit with a capital stock of $300,000, is preparing to remove to this city. The company has taken over the plant of the Lion Fence Co. and $15,000 has already been raised by citizens of Adrian to improve the plant and put it into shape for the use of the concern. The company is to manufacture the Blomstrom and Gyroscope cars, and expects to have its machines on the market the first of the year. Charles E. Blomstrom, of Detroit, is the designer of both cars.

RECENT INCORPORATIONS

New York—Allen Taxicab Co., capital stock $1,000,000, to own and operate motor cars. Incorporators, A. E. Wilson, G. A. K. Sutton, G. F. Holmes and K. K. McLaren, all of 37 Wall street.

Fort Worth, Tex.—Hodge-Pemberton Auto Co., capital $10,000. Stockholders, J. T. Pemberton, C. T. Hodge, B. T. Martin and others.

Enid, Tex.—Red Ball Automobile and Livery Co.; capital stock, $10,000. Incorporators, W. H. Hillis, G. J. Emrick.

Jersey City, N. J.—Bergen & West Side Motor Car Co.; capital stock, $100,000; to engage in the manufacture of motor cars. Incorporators, C. E. Collard, M. I. Collard and B. D. Sparks.

Montclair, O.—Montclair Riding, Driving and Automobile Club; capital stock, $2,000; to conduct exhibitions of horses and motor cars. Incorporators, L. L. Chinn, A. Morrison and D. Flannagan.

Troy, N. Y.—Wright-Rye Motor Co.; capital stock, $40,000; to manufacture motor cars, vehicles, carriages, boats, etc. Incorporators, W. D. K. Wright, W. H. Rye and G. A. Hubbard.

Oneonta, N. Y.—Central New York Automobile Co.; capital stock, $50,000. Incorporators, F. Anderson, H. L. Rothensies and G. A. Flint.

New York—Mayer Slotkin Mfg. Co.; capital stock, $50,000; to engage in the manufacture of cars, wagons, boats, motors, engines and machinery of various kinds. Incorporators, S. Slotkin, S. Goldstein and Jacob Burnstone.

Greenwood, Tenn.—Edgar Jameson is about to open a new garage and repair shop on Howard street, having already rented a building.

Austin, Tex.—The Automobile Sales and Supply Co., of San Antonio, has been incorporated with a capital stock of $20,000 by S. H. Wells and R. Campbell.

Springfield, Ill.—The E. R. Thomas Motor Branch Co., of Chicago, has been incorporated with a capital stock of $100,000, and is to deal in motor cars and accessories.

New Orleans, La.—The Bernius Automobile Co. has been incorporated with a capital stock of $5,000. The incorporators are the same as those behind the recently organized taxicab company.

Ithaca, Mich.—Charles M. Brown, who is the local agent for the Buick, is planning to erect a new garage and repair shop on South Pine River street at a cost of $8,000.

Danville, Ill—Gasaway Brothers, engaged in the sale of vehicles, motor cars and motor cycles, has filed a certificate of bankruptcy, with liabilities of more than $30,000 and assets of $10,000.

St. Paul, Minn.—C. B. Warren, who for some time past has represented the F. B. Stearns Co. on the Pacific coast, is going into business on his own account and will handle the Maxwell and other cars.

Houston, Tex.—The Auto and Motor Boat Co., which is the oldest garage and repair shop in the city, has been recently reorganized with F. W. Masters as president; A. I. Sellers, vice-president; George B. Nye, secretary, and D. W. Young, treasurer.

Atlanta, Ga.—J. W. Goldsmith, Jr., and T. D. Meador, Jr., are in the future to act as agents for the Speedwell. They have taken a lease of the property at 12-14 East Cain street and will open up their headquarters as soon as the necessary alterations are completed. In addition to the Speedwell car they will also handle the Gramm-Logan trucks. Arrangements are to be made for sub-agencies throughout the state.

St. Louis, Mo.—The Vogel Car Mfg. Co., which has just been incorporated with a capital stock of $75,000, and is to manufacture commercial cars to be sold directly from factory to user. The company has leased the building at Garrison avenue and Olive street, and the contract carries an option to buy. H. L. Vogel, formerly connected with the St. Louis Car Co. and the Danville Car Co., is president of the concern, and C. A. Gutke is secretary.